FEDERAL REGISTER

VOLUME 4 NUMBER 130

Washington, Saturday, July 8, 1939

Rules, Regulations, Orders

TITLE 7—AGRICULTURE

BUREAU OF AGRICULTURAL ECONOMICS

PART 26—AMENDMENT OF REGULATIONS UNDER THE UNITED STATES GRAIN STANDARDS ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Grain Standards Act, approved August 11, 1916 (39 Stat. 485; 7 U.S.C. 84), the regulations of the Secretary of Agriculture, S.R.A.–B.A.E. 148, approved April 2, 1935 (Part 26 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service" and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2375; Filed, July 6, 1939; 12:45 p. m.]

PART 27—AMENDMENT OF REGULATIONS UNDER THE UNITED STATES COTTON FUTURES ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Cotton Futures Act, approved August 11, 1916 (39 Stat. 477; 26 U.S.C. 1092), the regulations of the Secretary of Agriculture, S.R.A.–B.A.E. 152, approved July 6, 1936[1] (Part 27 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2382; Filed, July 6, 1939; 12:46 p. m.]

PART 28—AMENDMENT OF REGULATIONS UNDER THE UNITED STATES COTTON STANDARDS ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Cotton Standards Act, approved March 4, 1923 (42 Stat. 1519; 7 U.S.C. 61), the regulations of the Secretary of Agriculture, S.R.A.–B.A.E. 153, approved July 6, 1936,[1] (Part 28 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2381; Filed, July 6, 1939; 12:46 p. m.]

[1] 1 F.R. 1179.

[1] 1 F.R. 1187.

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PART 29—AMENDMENT OF RULES AND REGULATIONS UNDER THE TOBACCO INSPECTION ACT

Pursuant to the authority vested in the Secretary of Agriculture by the Tobacco Inspection Act, approved August 23, 1935 (49 Stat. 734; 7 U.S.C. Sup. IV, 511m), the rules and regulations of the Secretary of Agriculture, S.R.A.–B.A.E. 149, Revised, approved December 17, 1935 (Part 29 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2380; Filed, July 6, 1939; 12:46 p. m.]

PART 31—AMENDMENT OF RULES AND REGULATIONS UNDER THE WOOL STANDARDS ACT

Pursuant to the authority vested in the Secretary of Agriculture by the Wool Standards Act, approved May 17, 1928 (45 Stat. 594; 7 U.S.C. 415d), the rules and regulations of the Secretary of Agriculture, S.R.A.–B.A.E. 135, approved August 29, 1931, (Part 31 of Title 7 of the Code of Federal Regulations), are hereby amended by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2379; Filed, July 6, 1939; 12:46 p. m.]

PART 33—AMENDMENT OF GRADES, REQUIREMENTS AND REGULATIONS UNDER THE EXPORT APPLE AND PEAR ACT

Pursuant to the authority vested in the Secretary of Agriculture by the Export Apple and Pear Act, approved June 10, 1933 (48 Stat. 124; 7 U.S.C. 587), the grades, requirements and regulations of the Secretary of Agriculture, S.R.A.–B.A.E. 143, Revised, approved March 30, 1938[1] (Part 33 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said grades, requirements

[1] 3 F.R. 788 DI.

and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said grades, requirements and regulations and inserting in lieu thereof the word "Service."

These grades, requirements and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2363; Filed, July 6, 1939; 12:43 p. m.]

PART 41—AMENDMENT OF RULES AND REGULATIONS UNDER THE UNITED STATES STANDARD CONTAINER ACT OF 1928

Pursuant to the authority vested in the Secretary of Agriculture by the United States Standard Container Act of 1928, approved May 21, 1928 (45 Stat. 687; 15 U.S.C. 257h), the rules and regulations of the Secretary of Agriculture, S.R.A.-B.A.E. 116, approved October 10, 1928 (Part 41 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2378; Filed, July 6, 1939; 12:45 p. m.]

PART 46—AMENDMENT OF RULES AND REGULATIONS UNDER THE PERISHABLE AGRICULTURAL COMMODITIES ACT

Pursuant to the authority vested in the Secretary of Agriculture by the Perishable Agricultural Commodities Act, approved June 10, 1930 (46 Stat. 537; 7 U.S.C. 499-o), the rules and regulations of the Secretary of Agriculture, 3 F.R. 585 DI, approved March 1, 1938 (Part 46 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2377; Filed, July 6, 1939; 12:45 p. m.]

PART 47—AMENDMENT OF RULES AND REGULATIONS UNDER THE PRODUCE AGENCY ACT

Pursuant to the authority vested in the Secretary of Agriculture by the Produce Agency Act, approved March 3, 1927 (44 Stat. 1355; 7 U.S.C. 494), the rules and regulations of the Secretary of Agriculture, S.R.A.-B.A.E. 107, approved May 17, 1927 (Part 47 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2376; Filed, July 6, 1939; 12:45 p. m.]

PART 51—AMENDMENT OF RULES AND REGULATIONS GOVERNING THE INSPECTION AND CERTIFICATION OF FRUITS, VEGETABLES, AND OTHER PRODUCTS

Pursuant to the authority vested in the Secretary of Agriculture by Section 414, 7 U.S.C., Supp. IV, the Rules and Regulations of the Secretary of Agriculture Governing the Inspection and Certification of Fruits, Vegetables and Other Products, S.R.A.-B.A.E. 93, approved June 24, 1936[1] (Part 51 of Title 7 of the Code of Federal Regulations) are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2384; Filed, July 6, 1939; 12:46 p. m.]

PART 52—AMENDMENT OF RULES AND REGULATIONS GOVERNING THE GRADING AND CERTIFICATION OF CANNED FRUITS AND VEGETABLES

Pursuant to the authority vested in the Secretary of Agriculture by Section 414, 7 U.S.C., Supp. IV, the Rules and Regulations of the Secretary of Agriculture Governing the Grading and Certification of Canned Fruits and Vegetables, approved October 10, 1935 (Part 52 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2385; Filed, July 6, 1939; 12:47 p. m.]

PART 53—AMENDMENT OF RULES AND REGULATIONS GOVERNING THE GRADING AND CERTIFICATION OF MEATS, PREPARED MEATS, MEAT FOOD PRODUCTS AND MEAT BY-PRODUCTS FOR CLASS, QUALITY AND CONDITION

Pursuant to the authority vested in the Secretary of Agriculture by Section 414, 7 U.S.C., Supp. IV, the rules and regulations of the Secretary of Agriculture governing the grading and certification of meats, prepared meats, meat food products and meat by-products for class, quality and condition, S.R.A.-B.A.E. 98, approved December 8, 1936[1] (Part 53 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service";

[1] 1 F.R. 654.

[1] 1 F.R. 2126.

and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2386; Filed, July 6, 1939; 12:47 p. m.]

PART 54—AMENDMENT OF RULES AND REGULATIONS GOVERNING THE INSPECTION AND CERTIFICATION OF LIVE POULTRY AND LIVE DOMESTIC RABBITS FOR CLASS, QUALITY AND CONDITION

Pursuant to the authority vested in the Secretary of Agriculture by Section 414, 7 U.S.C., Supp. IV, the rules and regulations of the Secretary of Agriculture governing the inspection and certification of live poultry and live domestic rabbits for class, quality and condition, S.R.A.-B.A.E. 103, approved August 17, 1937[1] (Part 54 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2387; Filed, July 6, 1939; 12:47 p. m.]

PART 55—AMENDMENT OF RULES AND REGULATIONS GOVERNING THE GRADING AND CERTIFICATION OF BUTTER, CHEESE, EGGS, DRESSED POULTRY AND DRESSED DOMESTIC RABBITS FOR CLASS, QUALITY AND CONDITION

Pursuant to the authority vested in the Secretary of Agriculture by Section 414, 7 U.S.C., Supp. IV, the rules and regulations of the Secretary of Agriculture governing the grading and certification of butter, cheese, eggs, dressed poultry and dressed domestic rabbits for class, quality and condition, S.R.A.-B.A.E. 137, approved September 13, 1932 (Part 55 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2388; Filed, July 6, 1939; 12:47 p. m.]

PART 56—AMENDMENT OF RULES AND REGULATIONS GOVERNING THE INSPECTION AND CERTIFICATION OF DRESSED POULTRY AND DRESSED DOMESTIC RABBITS FOR EXTERNAL CONDITION AND OF DRESSED POULTRY AND DRESSED DOMESTIC RABBITS AND EDIBLE PORTIONS THEREOF FOR CONDITION AND WHOLESOMENESS

Pursuant to the authority vested in the Secretary of Agriculture by Section 414, 7 U.S.C., Supp. IV, the rules and regulations of the Secretary of Agriculture governing the inspection and certification of dressed poultry and dressed domestic rabbits for external condition and of dressed poultry and dressed domestic rabbits and edible portions thereof for condition and wholesomeness, S.R.A.-B.A.E. 131, approved August 17, 1937[1] (Part 56 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2389; Filed, July 6, 1939; 12:47 p. m.]

PART 57—AMENDMENT OF RULES AND REGULATIONS GOVERNING THE INSPECTION AND CERTIFICATION OF HAY AND STRAW FOR CLASS AND GRADE

Pursuant to the authority vested in the Secretary of Agriculture by Section 414, 7 U.S.C., Supp. IV, the rules and regulations of the Secretary of Agriculture governing the inspection and certification of hay and straw for class and grade, approved December 13, 1935 (Part 57 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2390; Filed, July 6, 1939; 12:47 p. m.]

PART 58—AMENDMENT OF RULES AND REGULATIONS OF THE SECRETARY OF AGRICULTURE GOVERNING THE INSPECTION AND CERTIFICATION OF BEANS AND PEAS

Pursuant to the authority vested in the Secretary of Agriculture by Section 414, 7 U.S.C., Supp. IV, the rules and regulations of the Secretary of Agriculture governing the inspection and certification of beans and peas, approved September 8, 1932 (Part 58 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2391; Filed, July 6, 1939; 12:48 p. m.]

PART 59—AMENDMENT OF RULES AND REGULATIONS GOVERNING ORIGIN VERIFICATION OF SEED

Pursuant to the authority vested in the Secretary of Agriculture by Section 414, 7 U.S.C., Supp. IV, the rules and regulations of the Secretary of Agriculture governing origin verification of seed, approved July 25, 1933 (Part 59 of Title 7 of the Code of Federal Regula-

[1] 2 F.R. 1414.

[1] 2 F.R. 1417.

tions), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2393; Filed, July 6, 1939; 12:48 p. m.]

PART 60—AMENDMENT OF REGULATIONS GOVERNING THE INSPECTION AND CERTIFICATION OF RICE

Pursuant to the authority vested in the Secretary of Agriculture by Section 414, 7 U.S.C., Supp. IV, the regulations of the Secretary of Agriculture governing the inspection and certification of rice, approved January 15, 1936 (Part 60 of Title 7 of Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C. this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2392; Filed, July 6, 1939; 12:48 p. m.]

PART 61—AMENDMENT OF RULES AND REGULATIONS GOVERNING THE INSPECTION, SAMPLING AND CERTIFICATION OF COTTONSEED SOLD OR OFFERED FOR SALE FOR CRUSHING PURPOSES

Pursuant to the authority vested in the Secretary of Agriculture by Section 414, 7 U.S.C., Supp. IV, the rules and regulations of the Secretary of Agriculture governing the inspection, sampling and certification of cottonseed sold or offered for sale for crushing purposes, approved June 7, 1938[1] (Part 61 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2395; Filed, July 6, 1939; 12:48 p. m.]

PART 62—AMENDMENT OF RULES AND REGULATIONS GOVERNING THE INSPECTION OF COUNTRY-RUN FORAGE SEEDS FOR DOCKAGE

Pursuant to the authority vested in the Secretary of Agriculture by Section 414, 7 U.S.C., Supp. IV, the rules and regulations of the Secretary of Agriculture governing the inspection of country-run forage seeds for dockage, approved October 8, 1938[1] (Part 62 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2394; Filed, July 6, 1939; 12:48 p. m.]

PART 101—AMENDMENT OF REGULATIONS FOR COTTON WAREHOUSES UNDER THE UNITED STATES WAREHOUSE ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Warehouse Act, approved August 11, 1916 (39 Stat. 490; 7 U.S.C. 268), the Regulations of the Secretary of Agriculture for Cotton Warehouses, S.R.A.-B.A.E. 126, approved April 27, 1931 (Part 101 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2362; Filed, July 6, 1939; 12:43 p. m.]

PART 102—AMENDMENT OF REGULATIONS FOR WAREHOUSEMEN STORING GRAIN UNDER THE UNITED STATES WAREHOUSE ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Warehouse Act, approved August 11, 1916 (39 Stat. 490; 7 U.S.C. 268), the Regulations of the Secretary of Agriculture for Warehousemen Storing Grain, S.R.A.-B.A.E. 127, approved May 9, 1931 (Part 102 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2364; Filed, July 6, 1939; 12:43 p. m.]

PART 103—AMENDMENT OF REGULATIONS FOR WAREHOUSEMEN STORING TOBACCO UNDER THE UNITED STATES WAREHOUSE ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Warehouse Act, approved August 11, 1916 (39 Stat. 490; 7 U.S.C. 268), the Regulations of the Secretary of Agriculture for Warehousemen Storing Tobacco, S.R.A.-B.A.E. 129, approved August 3, 1935 (Part 103 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said

[1] 3 F.R. 1361 DI.

[1] 3 F.R. 2436 DI.

regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2396; Filed, July 6, 1939; 12:49 p. m.]

PART 104—AMENDMENT OF REGULATIONS FOR WAREHOUSEMEN STORING WOOL UNDER THE UNITED STATES WAREHOUSE ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Warehouse Act, approved August 11, 1916 (39 Stat. 490; 7 U.S.C. 268), the Regulations of the Secretary of Agriculture for Warehousemen Storing Wool, S.R.A.-B.A.E. 128, approved May 12, 1931 (Part 104 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2365; Filed, July 6, 1939; 12:43 p. m.]

PART 105—AMENDMENT OF REGULATIONS FOR WAREHOUSEMEN STORING BROOMCORN UNDER THE UNITED STATES WAREHOUSE ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Warehouse Act, approved August 11, 1916 (39 Stat. 490; 7 U.S.C. 268), the Regulations of the Secretary of Agriculture for Warehousemen Storing Broomcorn, S.R.A.-B.A.E. 84, approved May 16, 1924 (Part 105 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2366; Filed, July 6, 1939; 12:43 p. m.]

PART 106—AMENDMENT OF REGULATIONS FOR WAREHOUSEMEN STORING DRY BEANS UNDER THE UNITED STATES WAREHOUSE ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Warehouse Act, aproved August 11, 1916 (39 Stat. 490; 7 U.S.C. 268), the Regulations of the Secretary of Agriculture for Warehousemen Storing Dry Beans, S.R.A.-B.A.E. 130, approved June 2, 1931 (Part 106 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2367; Filed, July 6, 1939; 12:43 p. m.]

PART 107—AMENDMENT OF REGULATIONS FOR WAREHOUSEMEN STORING NUTS UNDER THE UNITED STATES WAREHOUSE ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Warehouse Act, approved August 11, 1916 (39 Stat. 490; 7 U.S.C. 268), the Regulations of the Secretary of Agriculture for Warehousemen Storing Nuts, S.R.A.-B.A.E. 119, approved October 22, 1929 (Part 107 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2368; Filed, July 6, 1939; 12:44 p. m.]

PART 108—AMENDMENT OF REGULATIONS FOR WAREHOUSEMEN STORING SIRUPS UNDER THE UNITED STATES WAREHOUSE ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Warehouse Act, approved August 11, 1916 (39 Stat. 490; 7 U.S.C. 268), the Regulations of the Secretary of Agriculture for Warehousemen Storing Sirups, S.R.A.-B.A.E. 89, approved December 2, 1924 (Part 108 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2369; Filed, July 6, 1939; 12:44 p. m.]

PART 109—AMENDMENT OF REGULATIONS FOR WAREHOUSEMEN STORING DRIED FRUIT UNDER THE UNITED STATES WAREHOUSE ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Warehouse Act, approved August 11, 1916 (39 Stat. 490; 7 U.S.C. 268), the Regulations of the Secretary of Agriculture for Warehousemen Storing Dried Fruit, S.R.A.-B.A.E. 88, approved March 30, 1934 (Part 109 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and

the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2370; Filed, July 6, 1939; 12:44 p. m.]

PART 110—AMENDMENT OF REGULATIONS FOR WAREHOUSEMEN STORING CANNED FOODS UNDER THE UNITED STATES WAREHOUSE ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Warehouse Act, approved August 11, 1916 (39 Stat. 490; 7 U.S.C. 268), the Regulations of the Secretary of Agriculture for Warehousemen Storing Canned Foods, S.R.A.-B.A.E. 132, approved April 29, 1932 (Part 110 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2397; Filed, July 6, 1939; 12:49 p. m.]

PART 111—AMENDMENT OF REGULATIONS FOR WAREHOUSEMEN STORING COTTONSEED FOR COMMERCIAL BUT NOT FOR SEED STOCK PURPOSES UNDER THE UNITED STATES WAREHOUSE ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Warehouse Act, approved August 11, 1916 (39 Stat. 490; 7 U.S.C. 268), the Regulations of the Secretary of Agriculture for Warehousemen Storing Cottonseed for Commercial but not for Seed Stock Purposes, S.R.A.-B.A.E. 102, approved August 24, 1926 (Part 111 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the words "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2371; Filed, July 6, 1939; 12:44 p. m.]

PART 112—AMENDMENT OF REGULATIONS FOR WAREHOUSEMEN STORING COLD PACK FRUIT UNDER THE UNITED STATES WAREHOUSE ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Warehouse Act, approved August 11, 1916 (39 Stat. 490; 7 U.S.C. 268), the Regulations of the Secretary of Agriculture for Warehousemen Storing Cold Pack Fruit, S.R.A.-B.A.E. 111, approved May 26, 1928 (Part 112 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2372; Filed, July 6, 1939; 12:44 p. m.]

PART 113—AMENDMENT OF REGULATIONS FOR WAREHOUSEMEN STORING SEEDS UNDER THE UNITED STATES WAREHOUSE ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Warehouse Act, approved August 11, 1916 (39 Stat. 490; 7 U.S.C. 268), the Regulations of the Secretary of Agriculture for Warehousemen Storing Seeds, S.R.A.-B.A.E. 122, approved November 21, 1930 (Part 113 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2373; Filed, July 6, 1939; 12:45 p. m.]

PART 114—AMENDMENT OF REGULATIONS FOR WAREHOUSEMEN STORING CHERRIES IN SULPHUR DIOXIDE BRINE UNDER THE UNITED STATES WAREHOUSE ACT

Pursuant to the authority vested in the Secretary of Agriculture by the United States Warehouse Act, approved August 11, 1916 (39 Stat. 490; 7 U.S.C. 268), the Regulations of the Secretary of Agriculture for Warehousemen Storing Cherries in Sulphur Dioxide Brine, S.R.A.-B.A.E. 134, approved May 3, 1932 (Part 114 of Title 7 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Agricultural Economics" wherever they appear in said regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said regulations and inserting in lieu thereof the word "Service."

These regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2374; Filed, July 6, 1939; 12:45 p. m.]

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

[B.E.P.Q. 485 Second Revision]

WHITE-FRINGED BEETLE QUARANTINE RESTRICTIONS MODIFIED

SEC. 301.72A—ADMINISTRATIVE INSTRUCTIONS, REMOVAL OF WHITE-FRINGED BEETLE CERTIFICATION REQUIREMENTS UNTIL FEBRUARY 1, 1940, FOR SPECIFIED ARTICLES CONSIGNED FROM DESIGNATED PORTIONS OF THE REGULATED AREAS

Approved July 7, 1939; effective July 7, 1939

Circular B.E.P.Q. 485 revised, issued May 6, 1939,[1] effective May 8, 1939, waived certification requirements until July 1, 1939, for specified articles consigned from certain parts of the areas regulated under quarantine No. 72. The present revision extends the period of exemption from regulation for certain articles from areas hereinafter specified to February 1, 1940.

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[1] 4 F.R. 1977 DI.

Under authorization provided in Notice of Quarantine No. 72 (Sec. 301.72), all certification requirements are hereby waived during the regulated periods from July 1, 1939, to January 31, 1940, inclusive, of the following articles enumerated in Regulation 3 (*a*) and (*b*), (Sec. 301.72-3) when free from soil, it having been determined that sanitary measures and natural conditions have so reduced the risk of contamination with the egg or adult stage of the white-fringed beetle as to render certification unnecessary during the period indicated:

1. When consigned from the regulated areas in *Alabama*—Mobile County; *Florida*—Escambia County; *Louisiana*—Parish of East Baton Rouge; *Mississippi*—Jackson County, certification requirements are waived on the following articles:

Potatoes and sweetpotatoes.
Sweetpotato vines, draws, and cuttings.
Cordwood, pulpwood, stumpwood, and logs.
Used or unused lumber, timbers, posts, poles, crossties, and other building materials.
Hay, roughage of all kinds, straw, leaves, and leafmold.
Peas, beans, and peanuts in shells, or the shells of any of these products.
Seed cotton, cottonseed, baled cotton lint, and linters.
Used implements and machinery, scrap metal, junk, and utensils or containers coming in contact with the ground.
Brick, tiling, stone, and concrete slabs and blocks.
Nursery stock and other plants, which are free from soil.

2. When consigned from the regulated areas in *Mississippi*—Counties of Hinds and Pearl River, certification requirements are waived on the following articles:

Potatoes and sweetpotatoes.
Sweetpotato vines, draws, and cuttings.
Cordwood, pulpwood, stumpwood, and logs.
Used or unused lumber, timbers, posts, poles, crossties, and other building materials.
Hay, roughage of all kinds, straw, leaves, and leafmold.
Peas, beans, and peanuts in shells, or the shells of any of these products.
Used implements and machinery, scrap metal, junk, and utensils or containers coming in contact with the ground.
Brick, tiling, stone, and concrete slabs and blocks.
Nursery stock and other plants, which are free from soil.

3. When consigned from the regulated areas in *Louisiana*—Parishes of Jefferson, Orleans (including the City of New Orleans), and Plaquemines, certification requirements are waived on the following articles:

Potatoes and sweetpotatoes.
Sweetpotato vines, draws, and cuttings.
Cordwood, pulpwood, stumpwood, and logs.
Unused lumber, timber, posts, poles, and crossties.
Hay, roughage of all kinds, straw, leaves, and leafmold.
Peas, beans, and peanuts in the shells, or the shells of any of these products.
Seed cotton, cottonseed, baled cotton lint, and linters.

All articles, designated in paragraphs (*a*) and (*b*) of Regulation 3 of Quarantine No. 72[2] (Sec. 301.72-3) for which certification requirements are not hereinabove waived, shall remain under the restrictions of the quarantine during the period covered by this document.

(Issued under Sec. 301.72) [B.E.P.Q. 485, Second Revision, July 7, 1939]

[SEAL] AVERY S. HOYT,
Acting Chief.

[F. R. Doc. 39-2414; Filed, July 7, 1939; 11:58 a. m.]

FEDERAL CROP INSURANCE CORPORATION

[F.C.I.R.—Series 1, No. 1, Supp. 8[1]]

PART 401—WHEAT CROP INSURANCE REGULATIONS

AMENDMENTS

By virtue of the authority vested in the Federal Crop Insurance Corporation by the Federal Crop Insurance Act, approved February 16, 1938, as amended by Public Law No. 691 of the 75th Congress, approved June 22, 1938, the Regulations Relating to Wheat Crop Insurance, as amended, are hereby further amended, as follows:

By amending section 151, Part 15, to read, as follows:

Refund of any premium or portion thereof which has been paid to the Corporation by means of an advance from the Secretary of Agriculture shall be made to the Secretary of Agriculture. The amount of any such refund shall be determined in the manner provided for in Part 9 of these Regulations except that the cash equivalent of the amount of wheat to be refunded shall be determined using the basic market price and price differentials applicable as of the date of the advance from the Secretary of Agriculture; *Provided, however*, That in the case of the refund of a supplemental advance the cash equivalent of the amount of wheat to be refunded shall be determined using the basic market price and price differentials applicable as of the date of such supplemental advance.

Adopted by the Board of Directors on June 2, 1939.

[SEAL] M. L. WILSON,
Chairman.

Approved, July 6, 1939.

H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2415; Filed, July 7, 1939; 11:58 a. m.]

[1] 4 F.R. 2750 DI.
[2] 3 F.R. 3003 DI.

TITLE 9—ANIMALS AND ANIMAL PRODUCTS

BUREAU OF ANIMAL INDUSTRY

PARTS 201, 202, 203 AND 204—AMENDMENT OF RULES AND REGULATIONS UNDER THE PACKERS AND STOCKYARDS ACT

Pursuant to the authority vested in the Secretary of Agriculture by the Packers and Stockyards Act, approved August 15, 1921 (42 Stat. 169; 7 U.S.C. 228), the rules and regulations of the Secretary of Agriculture, B.A.I. order 364,[1] approved February 17, 1938 (Parts 201, 202, 203, and 204 of Title 9 of the Code of Federal Regulations), are hereby amended (1) by striking out the words "Bureau of Animal Industry" wherever they appear in said rules and regulations and inserting in lieu thereof the words "Agricultural Marketing Service"; and (2) by striking out the word "Bureau" wherever it appears in said rules and regulations and inserting in lieu thereof the word "Service."

These rules and regulations shall continue in effect and be administered by the Agricultural Marketing Service.

Done at Washington, D. C., this 6th day of July 1939. Witness my hand and the seal of the Department of Agriculture.

[SEAL] H. A. WALLACE,
Secretary of Agriculture.

[F. R. Doc. 39-2383; Filed, July 6, 1939; 12:46 p. m.]

TITLE 10—ARMY: WAR DEPARTMENT

CHAPTER IV—MILITARY EDUCATION

PART 45—AVIATION INSTRUCTION AT NON-FEDERAL ESTABLISHMENTS[2]

§ 45.1 *Specific application of these regulations.* These regulations apply specifically to aviation instruction given military personnel in regularly established civil flying schools and in civil technical schools. Training at other educational institutions, industrial plants, or places under the authority of the act of April 3, 1939, will be as prescribed by the Chief of the Air Corps and approved by the Secretary of War. (Sec. 2, Act April 3, 1939) [Par. 2, AR 350-3500, June 15, 1939]

§ 45.2 *Duties of the Chief of the Air Corps.* The Chief of the Air Corps is responsible for coordination of instruction. He will exercise supervision over all military personnel at institutions. He will determine the numbers of officers and enlisted men required for administrative and supervisory duties and the numbers of students that are to be trained, and will recommend the detail or relief of such personnel to the War Department. He is charged with the issuance of necessary instructions not provided for in these regulations. (Sec.

[1] 3 F.R. 499 DI.
[2] Part 45 is supplementary to Title 10, Chapter IV, of the Code of Federal Regulations.

2, Act April 3, 1939) [Par. 3, AR 350-3500, June 15, 1939]

§ 45.3 *Selection of institutions.* The selection of an institution to give instruction to military students will be made by the Secretary of War, upon recommendation of the Chief of the Air Corps.

(a) The primary requirement for selection will be the suitability of an institution to accomplish satisfactorily the training projected by the Air Corps. A prerequisite to the selection of a civil school is the holding of a rating or letter of recognition from the Civil Aeronautics Authority covering pertinent courses and subjects where the Authority takes cognizance of such instruction.

(b) The following factors when applicable will have special importance:

(1) Geographical location as it influences the cost of Government transportation or other expense, and the functioning of the system of supply and repair of Government property.

(2) Capacity for instruction of military personnel insofar as it warrants the maintenance of the requisite governmental supervisory and administrative establishment thereat.

(3) Ability to maintain output of trained military personnel at a uniform rate.

(4) Ability to conduct the desired training without undue hazard to personnel or property.

(5) Conditions affecting health and safety of military personnel, and the preservation and maintenance of Government property.

(6) Availability of suitable housing and messing facilities adjacent to place of instruction.

(7) Adequacy of instructional facilities and methods, and quality of instruction.

(8) Adequacy of facilities for maintenance and preservation of Government property.

(9) Provisions for maintaining the governmental supervisory and administrative establishment. (Sec. 2, Act April 3, 1939) [Par. 4, AR 350-3500, June 15, 1939]

§ 45.4 *Responsibilities of institutions.* In addition to functions provided for elsewhere in these regulations, institutions will be required to agree to the following prior to the assignment of military personnel thereat for instruction:

(a) To provide adequate and satisfactory housing and messing facilities or make arrangements therefor at a reasonable cost to personnel concerned, for all military students assigned for instruction.

(b) To provide adequate and satisfactory office and other space required by Government administrative personnel in the performance of their assigned duties.

(c) To comply with regulations prescribed by proper civil authorities to insure safety and with such supplementary instructions issued by the Chief of the Air Corps, or his representatives, in regard thereto and not in conflict therewith as may be deemed necessary in the premises.

(d) To save the Government harmless from liability for any injury or damage to persons and property, except Government personnel.

(e) To keep in the office of the school registrar and available to the Chief of the Air Corps or his representatives complete records pertaining to the training and progress of each military student. Records should be kept as prescribed by the Chief of the Air Corps.

(f) To give representatives of the Government access to books of account and records at such time as it may be necessary for the Government to determine actual cost of instruction.

(g) To open to inspection by Government representatives at any time all facilities employed for the training of military personnel. (Sec. 2, Act April 3, 1939) [Par. 5, AR 350-3500, June 15, 1939]

§ 45.5 *Agreements with institutions for instruction.* Services of schools will be procured by a contract in writing which will embody the terms and conditions governing the furnishing of the instruction contemplated herein. The cost of tuition for courses of instruction as authorized in these regulations will be established by negotiation (Sec. 2, Act April 3, 1939) [Par. 6, AR 350-3500, June 15, 1939]

§ 45.6 *Military organization*—(a) *Organization*—(1) *Air Corps training detachments.* A military detachment will be formed at institutions operating under the provisions of these regulations. All military personnel on duty at or assigned as students at each such school will be attached to this detachment. Detachments so organized will be designated as Air Corps training detachments. The geographical location will form the last part of the designation of each detachment. The senior Air Corps officer on duty with each detachment will be designated the Air Corps supervisor, and will command the detachment.

(2) *Districts.* For the purpose of properly supervising the training being conducted at schools in accordance with these regulations and properly coordinating activities of training and supply, the Chief of the Air Corps is authorized to divide the schools conducting military training into not to exceed three districts and to appoint a district supervisor in charge of each district. The duties and responsibilities of district supervisors will be as directed by the Chief of the Air Corps.

(b) *Exemption from command.* Detachments formed under the provisions of these regulations will be exempt from corps area supervision and control except for disciplinary matters and routine supply. (Sec. 2, Act April 3, 1939) [Par. 7, AR 350-3500, June 15, 1939]

§ 45.7 *Duties of Air Corps supervisor.* (a) The Air Corps supervisor will be an intermediary in all relations between the War Department and the institution at which he is assigned in matters pertaining to the instruction of military students thereat.

(b) In addition to his duties as commander of his detachment and such other duties as may be assigned by proper authority he will—

(1) Determine the continued adequacy and suitability of contractors' facilities and methods as they apply to the instruction of military students.

(2) Maintain contact with progress of military students and pass upon the eligibility of any student to receive a certificate of graduation.

(3) Determine the proficiency of students in their assignments at any time during the course of instruction.

(4) Be responsible for the discipline of military students at all times.

(5) Suspend the instruction of any military student when such action is necessary.

(6) Insure that no officer or enlisted man is conducting or pursuing any course of instruction at the school without proper authority of the War Department.

(7) Render reports prescribed by the Chief of the Air Corps and by pertinent Army Regulations. A special report will be submitted in writing covering any serious breach of contract or agreement on the part of any school or school representative, concerning which adequate corrective action has not been taken within a reasonable length of time. (Sec. 2, Act April 3, 1939) [Par. 8, AR 350-3500, June 15, 1939]

§ 45.8 *Termination of status as student.* (a) An academic board composed of officers will be appointed as directed by the Chief of the Air Corps at each institution which has been designated to give flying instruction to military personnel. This board will consider all cases that are referred to it by the Air Corps supervisor which involve the fitness of a student to continue instruction for any reason whatsoever and will make appropriate recommendations relating to the disqualification, discharge, or reinstatement of any student. If at any time the board decides that a military student is not qualified to continue the course, the Air Corps supervisor will—

(1) *In case of an officer.* Forward board proceedings in triplicate to the Chief of the Air Corps, who will take final action and will return one copy to the Air Corps supervisor and forward one copy to the Commanding Officer, Air Corps Training Center.

(2) *In case of a flying cadet.* Comply with the provisions of paragraph 18, AR 615-160.[2]

(b) If at any time a student enlisted man, other than a flying cadet, shall be deemed unfitted for any reasons to continue the course, the Air Corps super-

[2] Administrative regulations of the War Department relative to enlistment of flying cadets.

visor will immediately relieve him as a student and report the facts to the Commandant, Air Corps Technical School, for necessary action. (Sec. 2, Act April 3, 1939) [Par. 9, AR 350-3500, June 15, 1939]

§ 45.9 *Property.* All Government owned property required at institutions regardless of the purpose for which intended will be consigned to the commanding officer of the local Air Corps training detachment. Property transactions between the Air Corps supervisor and a school will be governed by paragraph (e) (2) (i), section 45.10. An accountable officer will be designated by the Chief of the Air Corps who will account for all Government property located at each institution. The Chief of the Air Corps will furnish each corps area commander concerned with the name or designation of the accountable officer. (Sec. 2, Act April 3, 1939) [Par. 10, AR 350-3500, June 15, 1939]

§ 45.10 *Loan of Government property*—(a) *General.* Property subject to loan will comprise any Government owned property mentioned and described in section 4, act of April 3, 1939. All loans of Government property will be made subject to return upon call of the Government, and without obligations upon the part of the Government to repair or replace the same in whole or in part unless otherwise specifically provided for by agreement in writing with the institution concerned.

(b) *Accredited aviation schools defined.* The term accredited aviation schools is defined as those flying schools or aviation mechanics schools that have been selected by the Secretary of War in accordance with section 45.3.

(c) *Eligibility for loans.* (1) The institution must be an accredited school within the definition of paragraph (b) above and under contractual obligations with the Government for the training of personnel of the Military Establishment pursuant to section 2, act of April 3, 1939.

(2) The detail of military personnel as students at institutions will not create any obligation on the part of the Government to provide property for the instruction of military students except as set forth in formal agreements that may be entered into by the Government with the institution concerned.

(d) *Administrative provisions.* (1) Loans of Government property, except serviceable aircraft, necessary for proper instruction at accredited aviation schools will be made at the discretion of the Chief of the Air Corps. The quantity and nature of the property, and the conditions under which loans will be made, will be as determined by the Chief of the Air Corps, except as otherwise provided for herein.

(2) The Chief of the Air Corps will secure the approval of the Secretary of War for the loan of all aircraft available for this purpose. The Chief of the Air Corps will make such allocations to institutions of serviceable aircraft approved for loan by the Secretary of War as are deemed necessary for the proper instruction of military personnel.

(3) Administrative details not inconsistent with these regulations respecting the loan of Government property and the maintenance thereof, including the extent to which an institution will be held responsible for replacement, repair, and overhaul, will be matters for determination by the Chief of the Air Corps.

(e) *Procedure*—(1) *Requisitions.* Requests for the issue of Government property will be submitted by the institution to the Air Corps supervisor. When authorized, the issue to the institution will be made by the Air Corps supervisor, or if not on hand will be obtained by him on requisition.

(2) *Loans.* (i) Government property will be loaned to institutions by the Air Corps supervisor on memorandum receipt. Credit memorandum receipt will be furnished the institution by the Air Corps supervisor for property returned to the War Department.

(ii) The responsible head or corresponding executive of the institution will designate in writing a representative who will sign all property papers for the school in the name of the institution.

(iii) Reports concerning the quantity and condition of Government property in its possession will be rendered by the institution as required by the Chief of the Air Corps.

(iv) The institution will make settlement for property held on memorandum receipt as required by the Air Corps supervisor.

(3) *Accounting.* Property will be accounted for as prescribed in section 45.9.

(f) *Transportation.* (1) Property authorized to be loaned under the provisions of paragraph (a) above will be delivered to an institution through the Air Corps supervisor by air, rail, or motor transportation as the interests of the Government may require, at the expense of the Government, except for drayage as provided for in subparagraph (2) below. The return of such property as requires rail or motor transportation, including property in the possession of the Air Corps supervisor, will be accomplished by the institution making delivery f. o. b. cars or motor truck, city of the institution concerned, properly packed, boxed, crated, and prepared for domestic shipment to such destination as may be determined by the Government. The return of airplanes in condition for flight will be accomplished by the institution, set up, serviced, and made ready for flight at the flying field of the institution concerned.

(2) All drayage of Government property to and from air or rail terminal, city of institution concerned, will be furnished by and at the expense of the institutions.

(3) The cost of transportation chargeable to the Government will be paid from funds allocated to the Chief of the Air Corps.

(g) *Lost, damaged, or destroyed property.* (1) Government property which becomes unserviceable through fair wear and tear incident to the proper and authorized use thereof will occasion no liability to the institution. Such property may be returned to the Government for replacement or credit or should be repaired by the institution in accordance with the terms of the written agreement that is entered into with the Government for the instruction of military personnel.

(2) Government property lost, destroyed, or damaged by fire, flood, theft, tornado, aircraft accident, or other similar causes, without fault or neglect on the part of the institution, its servants, or employees, will occasion no liability to the institution. To determine whether such loss, destruction, or damage was without fault or neglect on the part of the institution, its servants, or employees, a survey will be made as provided in paragraphs 6 and 8, AR 35-6640.[3] The surveying officer will be appointed in accordance with instructions issued by the Chief of the Air Corps. Reports of survey for property in the possession of an institution will be prepared by the Air Corps supervisor.

(3) All other loss, damage, or deterioration of Government property for which an institution is responsible will be made good by the institution. The Chief of Finance will take the necessary action to secure reimbursement to the United States for such loss, destruction, damage, or deterioration.

(4) The Air Corps supervisor will report to the authorities of the institution in writing any facts, circumstances, or conditions which he believes to be prejudicial to the proper protection of Government property against loss through fire, flood, theft, tornado, accident, or other similar causes. In the event that proper corrective action is not taken by the institution as the result of such communication, report thereof will be made to the Chief of the Air Corps. Access to all such reports will be afforded to surveying officers appointed under the provisions of subparagraph (2) above.

(5) The relief of institutions from liability in connection with property referred to above will in no way render inoperative any written agreement made by them with the Government for repairs and maintenance.

(h) *Maintenance and repair.* (1) The institution will keep and maintain property loaned to it in good repair and in the same condition as when received by it, usual wear, tear and usage excepted, unless otherwise specifically provided for in a written agreement made with the institution for the instruction of military personnel.

(2) Authorized Government representatives will have free access to all Government property loaned to an institution for the purpose of ascertaining the condition of such property and the manner in which it is being safeguarded, stored, maintained, and repaired.

[3] Administrative regulations of the War Department relative to survey of lost, destroyed, or unserviceable property.

(3) The Chief of the Air Corps may prescribe regulations that will facilitate proper inspection and maintenance of loaned Government property, when such regulations are consistent with the contractual obligations of the institution.

(i) *Care and safekeeping.* (1) None of the property owned by the Government and furnished to an institution under these regulations will be removed by the institution from the continental limits of the United States nor utilized by it for any other purpose than the instruction of military personnel or the performance of formal contracts pertaining to such instruction.

(2) Proper storage facilities will be furnished by the institution for all Government property in its possession and in the possession of the Air Corps supervisor. The place and manner of storage will provide satisfactorily for the care and safekeeping of Government property and will be such as to prevent undue and avoidable deterioration.

(3) Government parts, accessories, and supplies will in no case be stored or mingled with the articles of a like nature that belong to an institution. The manner of storage will permit ready identification of the property that is loaned by the Government and facilitate its inventory when such action is required. (Sec. 4, Act April 3, 1939) [Pars. 11 to 19, AR 350-3500, June 15, 1939]

[SEAL] E. S. ADAMS,
Major General,
The Adjutant General.

[F. R. Doc. 39-2401; Filed, July 7, 1939; 9:10 a. m.]

TITLE 12—BANKS AND BANKING

FEDERAL DEPOSIT INSURANCE CORPORATION

RESOLUTION APPROVING CERTIFIED STATEMENT FORMS

Paragraph (1) of subsection (h) of Section 12B of the Federal Reserve Act, as amended, provides in part:

The certified statements required to be filed with the Corporation under paragraphs (2), (3), and (4) of this subsection shall be in such form and set forth such supporting information as the board of directors shall prescribe.

Resolved, That pursuant to the provisions of paragraph (1) of subsection (h) of Section 12B of the Federal Reserve Act, as amended, the following described certified statement forms be approved:

(1) Certified Statement—Part One, Based on Deposits for the Six Months Ending June 30, 1939, Form 545H, in quadruplicate.[1]

(2) Recapitulation of the Monthly Totals of Certified Statement—Part Two, for the Six Months Ending June 30, 1939, Form 555H, in triplicate.[1]

[1] Filed as a part of the original document; requests for copies should be addressed to the Federal Deposit Insurance Corporation.

Adopted by the Board of Directors of the Federal Deposit Insurance Corporation on July 1, 1939.

[SEAL] E. F. DOWNEY,
Secretary.

[F. R. Doc. 39-2408; Filed, July 7, 1939; 10:49 a. m.]

TITLE 16—COMMERCIAL PRACTICES

FEDERAL TRADE COMMISSION

[Docket No. 3426]

IN THE MATTER OF EARL CHROME MANUFACTURING COMPANY

§ 3.99 (b) *Using or selling lottery devices—In merchandising.* Selling, etc., in connection with offer, etc., in commerce, of radios, clocks, cocktail shakers, coffee sets, or any other merchandise, any merchandise so packed and assembled that sales thereof to the general public are to be, or may be, made by means of a lottery, gaming device, or gift enterprise, prohibited. (Sec. 5, 38 Stat. 719, as amended by Sec. 3, 52 Stat. 112; 15 U.S.C., Supp. IV, sec. 45b) [Cease and desist order, Earl Chrome Manufacturing Company, Docket 3426, June 26, 1939]

§ 3.99 (b) *Using or selling lottery devices—In merchandising.* Supplying, etc., in connection with offer, etc., in commerce, of radios, clocks, cocktail shakers, coffee sets, or any other merchandise, others with any merchandise, together with punchboards, push or pull cards, or any other lottery device, or separately, to enable said persons to sell or distribute said merchandise by the use of said punchboards, etc., prohibited. (Sec. 5, 38 Stat. 719, as amended by Sec. 3, 52 Stat. 112; 15 U.S.C., Supp. IV, sec. 45b) [Cease and desist order, Earl Chrome Manufacturing Company, Docket 3426, June 26, 1939]

§ 3.99 (b) *Using or selling lottery devices—In merchandising.* Selling, etc., in connection with offer, etc., in commerce, of radios, clocks, cocktail shakers, coffee sets, or any other merchandise, any merchandise by means of a game of chance, gift enterprise, or lottery scheme, prohibited. (Sec. 5, 38 Stat. 719, as amended by Sec. 3, 52 Stat. 112; 15 U.S.C., Supp. IV, sec. 45b) [Cease and desist order, Earl Chrome Manufacturing Company, Docket 3426, June 26, 1939]

§ 3.69 (a) (4) *Misrepresenting oneself and goods—Business status, advantages or connections—Dealer as manufacturer:* § 3.96 (b) (5) *Using misleading name—Vendor—Producer or laboratory status of dealer.* Representing, in connection with offer, etc., in commerce, of radios, clocks, cocktail shakers, coffee sets, or any other merchandise, that respondent is the manufacturer of the merchandise which he sells and distributes, unless and until he owns and operates, or directly and absolutely controls, the plant or factory wherein said merchandise is manufactured by him, prohibited. (Sec. 5, 38 Stat. 719, as amended by Sec. 3, 52 Stat. 112; 15 U.S.C., Supp. IV, sec. 45b) [Cease and desist order, Earl Chrome Manufacturing Company, Docket 3426, June 26, 1939]

United States of America—Before Federal Trade Commission

At a regular session of the Federal Trade Commission, held at its office in the City of Washington, D. C., on the 26th day of June, A. D. 1939.

Commissioners: Robert E. Freer, Chairman; Garland S. Ferguson, Charles H. March, Ewin L. Davis, William A. Ayres.

IN THE MATTER OF MORRIS L. RAUER, INDIVIDUALLY, AND TRADING AS EARL CHROME MANUFACTURING COMPANY

ORDER TO CEASE AND DESIST

This proceeding having been heard[1] by the Federal Trade Commission upon the complaint of the Commission, the answer of respondent, testimony and other evidence taken before Charles F. Diggs, an examiner of the Commission theretofore duly designated by it, in support of the allegations of said complaint, brief filed herein by counsel for the Commission (respondent having offered no proof, filed no brief, and oral argument not having been requested), and the Commission having made its findings as to the facts and its conclusion that said respondent has violated the provisions of the Federal Trade Commission Act;

It is ordered, That the respondent, Morris L. Rauer, individually, and trading as Earl Chrome Manufacturing Company, or trading under any other name or names, his representatives, agents and employees, directly or through any corporate or other device, in connection with the offering for sale, sale and distribution of radios, clocks, cocktail shakers, coffee sets, or any other merchandise in commerce, as commerce is defined in the Federal Trade Commission Act, do forthwith cease and desist from:

(1) Selling or distributing any merchandise so packed and assembled that sales of such merchandise to the general public are to be made, or may be made, by means of a lottery, gaming device, or gift enterprise;

(2) Supplying to or placing in the hands of others any merchandise together with punchboards, push or pull cards, or any other lottery device, or separately, for the purpose of enabling said persons to sell or distribute said merchandise by the use of said punchboards, push or pull cards, or any other lottery device;

(3) Selling or otherwise disposing of any merchandise by means of a game of chance, gift enterprise, or lottery scheme;

(4) Representing that respondent is the manufacturer of the merchandise which he sells and distributes unless and until he owns and operates or directly and absolutely controls the plant or fac-

[1] 3 F.R. 2491 DI.

tory wherein said merchandise is manufactured by him.

It is further ordered, That the respondent shall, within sixty days after service upon him of this order, file with the Commission a report in writing, setting forth in detail the manner and form in which he has complied with this order.

By the Commission.

[SEAL] OTIS B. JOHNSON, *Secretary.*

[F. R. Doc. 39-2417; Filed, July 7, 1939; 12:55 p. m.]

[Docket No. 3580]

IN THE MATTER OF BOBS CANDY & PECAN COMPANY

§ 3.99 (b) *Using or selling lottery devices—In merchandising.* Selling, etc., in connection with offer, etc., in commerce, of candy and nut confections or any other merchandise, candy, etc., as aforesaid, so packed that sales of such candy, etc., are to be, or may be, made by means of a lottery, gaming device, or gift enterprise, prohibited. (Sec. 5, 38 Stat. 719, as amended by Sec. 3, 52 Stat. 112; 15 U.S.C., Supp. IV, sec. 45b) [Cease and desist order, Bobs Candy & Pecan Company, Docket 3580, June 26, 1939]

§ 3.99 (b) *Using or selling lottery devices—In merchandising.* Supplying, etc., in connection with offer, etc., in commerce, of candy and nut confections or any other merchandise, others with packages or assortments of candy, etc., as aforesaid, together with a push or pull card, punch board, or other lottery device, which push or pull card, etc., is to be, or may be, used in selling and distributing such candy, etc., to the public, prohibited. (Sec. 5, 38 Stat. 719, as amended by Sec. 3, 52 Stat. 112; 15 U.S.C., Supp. IV, sec. 45b) [Cease and desist order, Bobs Candy & Pecan Company, Docket 3580, June 26, 1939]

§ 3.99 (b) *Using or selling lottery devices—In merchandising.* Supplying, etc., in connection with offer, etc., in commerce, of candy and nut confections or any other merchandise, others with any lottery device, either with assortments of candy, etc., as aforesaid, or separately, which lottery device is to be, or may be, used in selling or distributing such candy, etc., as aforesaid, to the general public, prohibited. (Sec. 5, 38 Stat. 719, as amended by Sec. 3, 52 Stat. 112; 15 U.S.C., Supp. IV, sec. 45b) [Cease and desist order, Bobs Candy & Pecan Company, Docket 3580, June 26, 1939]

§ 3.99 (b) *Using or selling lottery devices—In merchandising.* Selling, etc., in connection with offer, etc., in commerce, of candy and nut confections or any other merchandise, any merchandise by means of a game of chance, gift enterprise or lottery scheme, prohibited. (Sec. 5, 38 Stat. 719, as amended by Sec. 3, 52 Stat. 112; 15 U.S.C., Supp. IV, sec. 45b) [Cease and desist order, Bobs Candy & Pecan Company, Docket 3580, June 26, 1939]

United States of America—Before Federal Trade Commission

At a regular session of the Federal Trade Commission, held at its office in the City of Washington, D. C., on the 26th day of June, A. D. 1939.

Commissioners: Robert E. Freer, Chairman; Garland S. Ferguson, Charles H. March, Ewin L. Davis, William A. Ayres.

ORDER TO CEASE AND DESIST

This proceeding having been heard[1] by the Federal Trade Commission upon the complaint of the Commission and the answer of respondent, in which answer respondent admits all the material allegations of fact set forth in said complaint and states that it waives all intervening procedure and further hearing as to said facts, and the Commission having made its findings as to the facts and conclusion that said respondent has violated the provisions of the Federal Trade Commission Act;

It is ordered, That the respondent, Bobs Candy and Pecan Company, its officers, representatives, agents and employees, directly or through any corporate or other device, in connection with the offering for sale, sale and distribution of candy and nut confections or any other merchandise in commerce, as commerce is defined in the Federal Trade Commission Act, do forthwith cease and desist from:

(1) Selling or distributing candy, nut confections or any other merchandise so packed and assembled that sales of such candy, nut confections or such merchandise, are to be made or may be made by means of a lottery, gaming device or gift enterprise;

(2) Supplying to or placing in the hands of others, packages or assortments of candy, nut confections or other merchandise together with a push or pull card, punch board, or other lottery device, which push or pull card, punch board or other lottery device is to be used or may be used in selling and distributing such candy, nut confections or other merchandise to the public;

(3) Supplying to or placing in the hands of others any lottery device either with assortments of candy, nut confections or other merchandise, or separately, which lottery device is to be used, or may be used in selling or distributing such candy, nut confections or other merchandise to the general public;

(4) Selling or otherwise distributing any merchandise by means of a game of chance, gift enterprise or lottery scheme.

It is further ordered, That the respondent shall, within sixty (60) days after service upon it of this order, file with the Commission a report in writing, setting forth in detail the manner and form in which it has complied with this order.

By the Commission.

[SEAL] OTIS B. JOHNSON, *Secretary.*

[F. R. Doc. 39-2418; Filed, July 7, 1939; 12:55 p. m.]

[1] 4 F.R. 1647 DL

TITLE 19—CUSTOMS DUTIES

BUREAU OF CUSTOMS

[T. D. 49909]

COUNTERVAILING DUTY, SILK GOODS FROM ITALY

COLLECTORS OF CUSTOMS INSTRUCTED TO SUSPEND LIQUIDATION OF ENTRIES COVERING SILK GOODS FROM ITALY PENDING DECLARATION OF AMOUNT OF COUNTERVAILING DUTY TO BE COLLECTED; DEPOSIT OF ESTIMATED COUNTERVAILING DUTIES REQUIRED

To Collectors of Customs and Others Concerned:

Official reports before the Department establish to its satisfaction that bounties or grants are paid or bestowed directly or indirectly in Italy on the export to the United States of silk goods which are dutiable under the provisions of the Tariff Act of 1930.

Notice is hereby given that pursuant to the provisions of section 303 of the Tariff Act of 1930 (U.S.C., title 19, sec. 1303), countervailing duties equal to any bounty or grant found to have been paid or bestowed will be collected on dutiable merchandise composed in whole or in part of silk and imported directly or indirectly from Italy, when entered for consumption or withdrawn from warehouse for consumption after thirty days after publication of this notice in a weekly issue of Treasury Decisions, whether imported in the condition in which exported from Italy or changed in condition by remanufacture or otherwise.

The liquidation of all entries covering merchandise described above and entered for consumption or withdrawn from warehouse for consumption after thirty days after publication of this notice in a weekly issue of Treasury Decisions shall be suspended pending the declaration of the net total amount of the bounty or grant determined or estimated to have been paid or bestowed and the net amount of the countervailing duties to be collected. A deposit of estimated countervailing duties shall be required at the time of entry. The foregoing instructions, however, shall not apply to importations consisting of gifts for the personal use of the donee or of articles purchased at retail for personal use. The amount to be deposited shall be calculated in accordance with the following table and predicated on the net

weights of the silk (including schappe and bourrette) contained in the imported products, plus 33⅓% of such weights if the natural gum has been removed from the silk used in the production or manufacture of the imported product:

(a) Raw silk yarns, dyed, simple or twisted of double cocoons; lire 32.8 per kilogram.

(b) Yarns of silk waste (schappe) including sewing thread; lire 49.2 per kilogram.

(c) Yarns of combings (bourrette); lire 8.2 per kilogram.

(d) Raw silk doubled and twisted, drawn, dyed silk, silk sewing thread; lire 84.5 per kilogram.

(e) Woven materials, velvets, ribbons, tulles, crepes, knit goods and stockings, in raw state; lire 87 per kilogram, subject to the following variations:

(1) For every kilogram of double yarn lire 34.8.

(2) For every kilogram of yarn of waste content lire 52.2.

(3) For every kilogram of yarn of bourrette content lire 8.2.

(f) Woven materials, velvets, ribbons, tulles, crepes, knit goods and stockings, exported in the dyed or finished state; lire 89.5 per kilogram of silk content (not weighted), subject to the following variations:

(1) For every kilogram of double yarn content lire 36.8.

(2) For every kilogram of yarn of waste content lire 55.2.

(3) For every kilogram of yarn of bourrette content lire 9.2.

The facts in regard to each importation shall be reported promptly to the Bureau of Customs. The entry and related papers shall accompany the report.

[SEAL] JAMES H. MOYLE,
Commissioner of Customs.

Approved, 3:35 p. m., July 5th, 1939.

H. MORGENTHAU, Jr.,
Secretary of the Treasury.

[F. R. Doc. 39-2399; Filed, July 6, 1939; 3:13 p. m.]

TITLE 31—MONEY AND FINANCE: TREASURY

CHAPTER I—MONETARY OFFICES

PART 80—THE NEWLY-MINED DOMESTIC SILVER REGULATIONS OF JULY 6, 1939*

Sec.

80.1 Scope.
80.2 Authority for regulations.
80.3 Definitions.
80.4 Forms.
80.5 Revocation or modification.
80.6 Silver which will be received.
80.7 Affidavits.
80.8 Evidence which may be demanded.
80.9 Settlement for silver delivered.
80.10 Records.
80.11 Reports.
80.12 Agreement relating to records.

*Sections 80.1 to 80.12, inclusive, issued under the authority contained in Section 4 of the Act of July 6, 1939.

§ 80.1 *Scope.* These regulations relate to the receipt and coinage by the United States coinage mints of silver mined in the United States or any place subject to the jurisdiction thereof pursuant to the provisions of section 4 of the Act of July 6, 1939.*

§ 80.2 *Authority for regulations.* These regulations are issued under section 4 of the Act of July 6, 1939.*

§ 80.3 *Definitions.* As used in these regulations—

The term "person" means an individual, partnership, association, or corporation.

The term "United States coinage mints" means the following mints: United States Mint, Philadelphia, Pa.; United States Mint, San Francisco, Calif.; United States Mint, Denver, Colo. And whenever authority is conferred in these regulations upon a "mint" such authority is conferred upon the person locally in charge of the mint, acting in accordance with instructions of the Director of the Mint or the Secretary of the Treasury.*

§ 80.4 *Forms.* Any form, the use of which is prescribed in these regulations, may be obtained at any United States mint or assay office or at the Treasury Department, Washington, D. C.*

§ 80.5 *Revocation or modification.* The provisions of these regulations may be revoked or modified at any time.*

§ 80.6 *Silver which will be received.* The United States coinage mints, under the conditions hereinafter specified, and subject to the appropriate regulations governing the mints, will receive silver which any such mint is satisfied has been mined subsequently to July 1, 1939, from natural deposits in the United States or any place subject to the jurisdiction thereof.

Such mints will also receive silver which forms a part of a mixture of domestic, secondary and/or foreign silver provided such mints are satisfied that the aggregate amount of such mixture so received does not exceed the amount of such mixture which has been mined subsequently to July 1, 1939, from natural deposits in the United States or any place subject to the jurisdiction thereof.*

§ 80.7 *Affidavits.* Every person delivering silver under the provisions of these regulations shall file with each delivery a properly executed affidavit on form TSA-1 and supporting affidavit or affidavits of the miner or miners on form TSA-2 or TSA-2A, whichever is appropriate, containing the information called for in such forms and executed under oath before an officer duly authorized to administer oaths.*

§ 80.8 *Evidence which may be demanded.* Persons delivering silver under the provisions of these regulations shall furnish such further evidence as may from time to time be requested by any United States coinage mint or the Director of the Mint, including affidavits, sworn reports, and sworn abstracts from books of account of any mines or any or all smelters or refineries handling such silver.*

§ 80.9 *Settlement for silver delivered.* The Director of the Mint, pursuant to the consent of the owner as given in the agreement executed on form TSA-1, shall retain of the silver so delivered, 45 per cent as seigniorage for services performed by the Government of the United States, and the balance of such silver so received, that is, 55 per cent thereof, shall be coined into standard silver dollars and the same, or an equal number of other standard silver dollars (or, at the option of the owner of the silver so delivered, silver certificates or any other coin or currency of the United States in an amount in dollars equal to such standard silver dollars), shall be delivered to the owner of such silver. Any fractional part of one dollar due hereunder shall be returned in any legal tender coin of the United States.*

§ 80.10 *Records.* Every person delivering silver under these regulations, and every person owning or operating a smelter or refinery at which silver to be delivered under these regulations is mixed with secondary or foreign silver, or both, shall keep accurate records of all acquisitions, by mining or otherwise, and of all dispositions of silver mined subsequently to July 1, 1939, including, among other things, records of the date when such silver was mined, acquired, and disposed of. Such records shall be preserved for at least 1 year after the last delivery and made available for examination by a representative of the Director of the Mint upon the request of such representative.*

§ 80.11 *Reports.* Every person delivering silver under these regulations shall file with the Director of the Mint, on or before the 25th day of each month after the date the first delivery is made, a report on form TSA-3 covering the preceding calendar month, provided that the first report shall cover the period from July 1, 1939, to the end of the calendar month preceding the date of the report. Such reports shall be executed under oath before an officer duly authorized to administer oaths and shall contain all of the information called for in such form.*

§ 80.12 *Agreement relating to records.* Every person delivering under these regulations, silver which has been mixed with secondary or foreign silver, or both, at a smelter or refinery other than that of the person making the delivery, shall, upon request by any United States coinage mint or the Director of the Mint, also filed with each delivery of such silver an agreement properly executed under oath by a duly authorized officer of such other smelter or refinery, that the records will be kept as provided in these regulations, and that such records will be available for examination by a representative of the Director of the Mint for at least 1 year after the last delivery.*

[SEAL] H. MORGENTHAU, Jr.,
Secretary of the Treasury.

[F. R. Doc. 39-2400; Filed, July 6, 1939; 5:21 p. m.]

TITLE 47—TELECOMMUNICATION

FEDERAL COMMUNICATIONS COMMISSION

STANDARDS OF GOOD ENGINEERING PRACTICE CONCERNING STANDARD BROADCAST STATIONS (550–1600 kc)

APPROVED JUNE 23, 1939; EFFECTIVE AUGUST 1, 1939

Introduction

There are presented herein the Standards of Good Engineering Practice giving interpretations and further considerations concerning the Rules and Regulations of the Communications Commission governing standard broadcast stations.[1] While the Rules and Regulations form the basis of good engineering practice, these standards may go beyond the Rules and Regulations and set up engineering principles for consideration of various allocation problems. These standards have been approved by the Commission and thus are considered as reflecting the opinion of the Commission in all matters involved.

The Rules and Regulations contain references to these standards, however, as further standards may be issued after the Rules and Regulations are published, the absence of such references does not relieve the responsibility of meeting the requirements specified herein. The Standards of Good Engineering Practic are collected in this publication for the convenience of all considering broadcast station operation and problems.

The Standards of Good Engineering Practice set forth herein are those deemed necessary for the construction and operation of standard broadcast stations to meet the requirements of technical regulations and for operation in public interest along technical lines not specifically enunciated in the Regulations. These standards are based on the best engineering data available from evidence supplied in formal and informal hearings and extensive surveys conducted in the field by the Commission's personnel. Numerous informal conferences have been held with radio engineers, manufacturers of radio equipment and others for the guidance of the Commission in the formulation of these standards.

These standards are complete in themselves and supersede any previous announcements or policies which may have been enunciated by the Commission on engineering matters concerning standard broadcast stations.

While these standards provide for flexibility and set forth the conditions under which they are applicable, it is not expected that material deviation therefrom as to fundamental principles will be recognized unless full information is submitted as to the reasonableness of such departure and the need therefor.

[1] 4 F.R. 2714 DI.

These Standards of Good Engineering Practice will necessarily change as progress is made in the art and accordingly it will be necessary to make revisions from time to time. The Commission will accumulate and analyze engineering data available as to the progress of the art so that its standards may be kept current with the developments.

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1. Engineering Standards of Allocation.
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5. Minimum Antenna Heights or Field Intensity Requirements.
6. Standard Lamps and Paints.
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11. Operating Power Tolerance.
12. Construction, General Operation and Safety of Life Requirements.
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14. Requirements for Approval of Broadcast Transmitters and Automatic Frequency Control Equipments.
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21. Approved Frequency Monitors.
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23. Approved Equipment.
24. Standard Broadcast Application Forms.
25. Field Offices of the Commission.
26. Average Sunset Time.

[*Figures 1–7, inclusive, referred to hereinafter, were filed as a part of the original document; requests for copies should be addressed to the Federal Communications Commission.*]

1. ENGINEERING STANDARDS OF ALLOCATION

Section 3.28 requires that individual broadcast station assignments shall be made in accordance with the standards of good engineering practice prescribed and published from time to time by the Commission. These standards for each class of station are set out below.

Sections 3.21 to 3.34, inclusive, govern the allocation of facilities in the standard broadcast band of 550 to 1600 kc., inclusive. Section 3.21 establishes three classes of channels in this band, namely, clear channels for the use of high-powered stations, regional channels for the use of medium-powered stations, and local channels for the use of low-powered stations. The classes and power of standard broadcast stations which will be assigned to the various channels are set forth in Section 3.22. The classification of the standard broadcast stations are as follows:

Class I stations are dominant stations operating on clear channels as follows:

(1) Class I stations operate with powers of not less than 10 or more than 50 kw. These stations are designed to render primary and secondary service over an extended area and at relatively long distances, hence have their primary service areas[2] free from objectionable interference from other stations on the same and adjacent channels and secondary service areas free from objectionable interference from stations on the same channels.[3] [4]

(2) From an engineering point of view Class I stations may be divided into two groups:

(a) The Class I stations in Group 1 are those assigned to the channels allocated by Section 3.25, paragraph (a), on which duplicate nighttime operation is not permitted, that is, no other station is permitted to operate on a channel with a Class I station of this group within the limits of the United States (the Class II stations assigned the channels operate limited time or daytime only) and during daytime the Class I station is protected to the 100 uv/m ground wave contour. Protection is given this class of station to the 500 uv/m ground wave contour from adjacent channel stations for both day and nighttime operation.[3] The power of each Class I station shall not be less than 50 kw.

(b) The Class I stations in Group 2 are those assigned to the channels allocated by Section 3.25, paragraph (b), on which duplicate operation is permitted, that is, other Class I or Class II stations operating unlimited time may be assigned to such channels. During nighttime hours of operation a Class I station of this group is protected to the 500 uv/m 50% sky wave contour and during daytime hours of operation to the 100 uv/m ground wave contour from stations on the same channel. Protection is given to the 500 uv/m ground wave contour from stations on adjacent channels for

[2] See Section 3.31 for the definitions of primary and secondary service areas.

[3] See Tables IV and V.

[4] The secondary service area of a Class I station is not protected from adjacent channel interference. However, in case of placing a station on an adjacent channel (10 kc removed) to a Class I station which would substitute a primary service for the secondary service, the matter of the program service as well as the signal service of the two stations should be given consideration. That is, at the 0.5 mv/m 50% sky wave contour of a Class I station purely for the determination of comparative service, the area bound by 1 mv/m contour of a Class II, Class III or Class IV station 10 kc removed may be taken as the area within which the secondary service of the Class I station is precluded. For higher values of 50% sky wave signal from a Class I station the ratio of the ground wave to sky wave shall be 2 to 1 and considered only within the 0.5 mv/m 50% sky wave contour of the Class I station.

both day and nighttime operation.[2] The operating powers of Class I stations on these frequencies shall be not less than 10 kw nor more than 50 kw.

Hereafter, for the purpose of convenience, the two groups of Class I stations will be termed Class Ia or Ib in accordance with the assignment to channels allocated by Section 3.25 (a) or 3.25 (b).

Class II stations are secondary stations which operate on clear channels with powers not less than 0.25 kw. or more than 50 kw. These stations are required to use a directional antenna or other means to avoid causing interference within the normally protected service areas of Class I stations or other Class II stations. These stations normally render primary service only, the area of which depends on the geographical location, power and frequency. This may be relatively large but is limited by and subject to such interference as may be received from Class I stations. However, it is recommended that Class II stations be so located that the interference received from Class I stations will not limit the service area to greater than the 2500 uv/m ground wave contour which is the value for the mutual protection of this class of station with other stations of the same class.[3]

Class III stations operate on regional channels and normally render primary service to the metropolitan district and the rural area contained therein and contiguous thereto and are subdivided into two classes:

(a) Class III–A stations which operate with powers not less than 1 kw. or more than 5 kw. are normally protected to the 2500 uv/m ground wave contour nighttime and the 500 uv/m ground wave contour daytime.[3]

(b) Class III–B stations which operate with powers not less than 0.5 kw. or more than 1 kw. nighttime and 5 kw. daytime are normally protected to the 4000 uv/m ground wave contour nighttime and 500 uv/m ground wave contour daytime.[3]

Class IV stations operate on local channels normally rendering primary service only to a city or town and the suburban and rural areas contiguous thereto with powers not less than 0.1 kw. or more than 0.25 kw. These stations are normally protected to the 4000 uv/m ground wave contour nighttime and 500 uv/m ground wave contour daytime. On local channels the separation required for the daytime protection shall also determine the nighttime separation. Class IV stations may be assigned to regional channels on condition that interference will not be caused to any Class III station in accordance with the above and that the channel is used adequately and properly for Class III stations[5] and that the Class IV station will be subject to such interference as may be received from the Class III stations. That is, the Class IV station assigned to a regional channel shall protect the Class III station to the required contour but the Class III station is under no obligation to protect the Class IV station so assigned. However, it is recommended that the Class IV stations be so located that the interference received will not be greater than to the 4000 uv/m ground wave contour night and 500 uv/m daytime.

The class of any station is determined by the channel assignment, the power, and the field intensity contour to which it renders service free of interference from other stations as determined by these standards. No station will be permitted to change to a class normally protected to a contour of less intensity than the contour to which the station actually renders interference free service. Any station of a class normally protected to a contour of less intensity than that to which the station actually renders interference free service, will be automatically reclassified according to the class normally protected the minimum consistent with its power and channel assignment. Likewise any station to which the interference is reduced so that service is rendered to a contour normally protected for a higher class will be automatically changed to that class if consistent with its power and channel assignment.

When it is shown that primary service is rendered by any of the above classes of stations, beyond the normally protected contour, and when primary service to approximately 90% of the population (population served with adequate signal) of the area between the normally protected contour and the contour to which such station actually serves, is not supplied by any other station or stations carrying the same general program service, the contour to which protection may be afforded in such cases will be determined from the individual merits of the case under consideration.

A Class II, III–B or IV station may be assigned to a channel available for such class, when a need therefor is shown, even though objectionable interference will be received to a field intensity contour greater than that specified as the normally protected contour for its class, provided that no objectionable interference will be caused by it to existing stations, and provided further, that the population residing in the area between the normally protected contour for its class and the contour to which objectionable interference will be received, does not exceed approximately 10% of the population in its actual primary service area.

When a station is already limited by interference from other stations to a contour of higher value than that normally protected for its class, this contour shall be the established standard for such station with respect to interference from all other stations.

Tables IV and V give a complete summary of the protected service contours and permissible interference signals for broadcast stations on the same and adjacent channels, respectively.

The several classes of broadcast stations have in general three service areas;[6] namely, primary, secondary, and intermittent service areas. Class I stations render service to all three service areas. Class II stations render service to a primary area but the secondary and intermittent service areas may be materially limited or destroyed due to interference from other stations depending on the station assignments involved. Class III and IV stations usually have only primary service areas as interference from other stations generally prevents any secondary service and may limit the intermittent service area. However, complete intermittent service may be obtained in many cases depending on the station assignments involved.

The signals necessary to render the different types of service are listed below.

TABLE I.—*Primary Service*

Area:	*Field intensity ground-wave*[1]
City business or factory areas	10 to 50 mv/m.
City residential areas	2 to 10 mv/m.
Rural—all areas during winter or northern areas during summer	0.1 to 0.5 mv/m.
Rural—southern areas during summer	0.25 to 1.0 mv/m.

[1] See Appendix I for curves showing distance to various ground wave field intensity contours for different frequencies, ground conductivity, and power.

All these values are based on an absence of objectionable fading either in changing intensity or selective fading, the usual noise level in the areas[7] and an absence of limiting interference from other broadcast stations. The values apply both day and night but generally fading or interference from other stations limits the primary service at night

[2] See Tables IV and V.

[5] The assignment of a Class IV station to a regional channel normally is not considered as making the best usage of the assignment and will be made only when it is shown among other things that

1. There is no other transmission facilities in the town or towns in the proposed service area.

2. There is no local channel assignment available for that area.

3. Adequate economic support is not available for a Class III station.

4. It is not practical from an engineering point of view to establish a Class III station and it would not prevent the establishment of any Class III station on that channel or an adjacent channel.

[6] See Section 3.31 for definitions of these service areas.

[7] See third footnote following.

in all rural areas to higher values of field intensity than the values given.

In determining the population of the primary service area, it may be considered that the following signals are satisfactory to overcome man-made noise in towns of the population given.

TABLE II

Population:	*Field intensity groundwave*
Up to 2,500	0.5 mv/m.
2,500 to 10,000	2.0 mv/m.
10,000 and up	Values given in Table I.

These values are subject to wide variations in individual areas and especial attention must be given to interference from other stations. The values are not considered satisfactory in any case for service to the city in which the main studio of the station is located. The values in Table I shall apply except as individual consideration may determine.

All classes of broadcast stations have primary service areas subject to limitation by fading and noise, and interference from other stations to the contours set out for each class of station.

Secondary Service

Secondary service is delivered in the areas where the sky wave for 50% or more of the time has a field intensity of 500 uv/m or greater.[8] It is not considered that satisfactory secondary service can be rendered to cities unless the sky wave approaches in value the ground wave required for primary service. The secondary service is necessarily subject to some interference and extensive fading whereas the primary service area of a station is subject to no objectionable interference or fading.[9] Class I stations only are assigned on the basis of rendering secondary service.

Intermittent Service

The intermittent service is rendered by the ground wave and begins at the outer boundary of the primary service area and extends to the value of signal where it may be considered as having no further service value. This may be down to only a few microvolts in certain areas and up to several millivolts in other areas of high noise level, interference from other stations, or objectionable fading at night. The intermittent service area may vary widely from day to night and generally varies from time to time as the name implies. Only Class I stations are assigned for protection from interference from other stations into the intermittent service area.

Section 3.23 provides that the several classes of broadcast stations may be licensed to operate unlimited time, limited time, daytime, sharing time and specified hours, with full explanation given in the Section.

Section 3.24 sets out the general requirements for obtaining an increase in facilities of a licensed station and for a new station. Paragraph 2 concerns the matter of interference that may be caused by a new assignment or increase in facilities of an existing assignment.

Objectionable interference from another broadcast station[10] is the degree of interference produced when, at a specified field intensity contour with respect to the desired station, the field intensity of an undesired station (or the root-sum-square value of field intensities of two or more stations on the same frequency) exceeds for ten (10) per cent or more of the time the values set forth in these standards.

With respect to the root-sum-square values of interfering field intensities referred to herein, it shall be understood to apply in determining the interference between existing stations.[11] It is not considered that increased objectionable interference is caused when (in the case where interference is predominantly from a single station) a signal from another station is added which does not have an intensity greater than 70% of the value of the highest signal already causing interference. In case such highest value of signal can not be determined separately, then the maximum value of any signal that can be added without considering that an increase in objectionable interference results, should be determined as follows: For two interfering signals of approximately the same value the signal added should not exceed 85% of the computed value of a single signal from the estimated or measured RSS value. For more than two interfering signals of approximately the same value, the added signal should not exceed the value of a single signal computed from the RSS value. This formula should be used to compute the value of the single signal.

$$E=\sqrt{\frac{F^2}{N}}$$

where E is the value of a single signal.
F is RSS field intensity as measured by the usual field intensity meter.
N is the number of interfering signals of approximately the same value.

Objectionable interference from a station on the same channel shall be considered to exist to a station when, at the field intensity contour specified in Table I with respect to the class to which the station belongs, the field intensity of an interfering station (or the root-sum-square value of the field intensities of two or more interfering stations) operating on the same channel, exceeds for ten (10) percent or more of the time the value of the permissible interfering signal set forth opposite such class in Table IV.

Objectionable interference from a station on an adjacent channel shall be considered to exist to a station when, at the normally protected contour of a desired station, the field intensity of the ground wave of an undesired station operating on an adjacent channel (or the root-sum-square value of the field intensities of two or more such undesired stations operating on the same adjacent channel) exceeds a value specified in Table V.

For the purpose of calculating the presence and the degree of objectionable interference, stations of the several classes shall be assumed, in the absence of actual measurements or data on the design of the antenna system, to produce effective fields, for one kilowatt of input power to the antenna, as follows:

TABLE III

Class of station:	*Effective field*
I	225 mv/m.
II and III	175 mv/m.
IV	150 mv/m.

In case a directional antenna is employed, the interfering signal of a broadcasting station will vary in different directions, being greater than the above values in certain directions and less in others, depending upon the design and adjustment of the directional antenna system. To determine the interference in any direction, in the absence of actual interference measurements, the horizontal and vertical field intensity patterns of the directional antenna must be calculated and compared with the appropriate vectors in the horizontal or vertical patterns of a non-directional antenna having the same effective field. Thus the interfering signal toward any other station can be expressed in terms of kilowatts. This rating in kilowatts shall be applied in the use of mileage separation

[8] The secondary service area of a Class Ia station should be considered as having this limit only for determination of service in comparison with other stations.

[9] Standards have not been established for objectionable fading as such standards would necessarily depend on the receiver characteristics which have been changed considerably in this regard during the last several years. Selective fading causing audio distortion and the signal fading below the noise level are the objectionable characteristics of fading on modern design receivers. Th AVC circuits in the better designed modern receivers in general maintain the audio output sufficiently constant to be satisfactory during most fading.

[10] Standards have not been established for interference from atmospherics or man-made electric noise as no uniform method of measuring noise as static has been established. In any individual case objectionable interference from any source, except other broadcast signals, may be determined by comparing the actual noise interference reproduced during reception of a desired broadcast signal to the degree of interference that would be caused by another broadcast signal within 20 cycles of the desired signal and having a carrier ratio of 20 to 1 with both signals modulated 100% on peaks of usual programs. Standards of noise measurements and interference ratio for noise are now being studied.

[11] In computing interference to any station only the RSS value of all signals which are within 70% of the highest signal shall be considered.

tables or in computing interference from the propagation curves.[13]

The existence or absence of objectionable interference from stations on the same or adjacent channels shall be determined by one of the following methods:

(a) By actual measurements made according to the method hereafter described;

or, in the absence of such measurements:

(b) By reference to the propagation curves in Figures 1 and 2, or

(c) By reference to the distance tables set forth in Tables VI, VII and VIII.

The existence or absence of objectionable interference may be proved by field intensity measurements or recordings made with suitable apparatus, duly calibrated. Such field intensity measurements of sky wave shall be made for a period of time not less than 10 days and an adequate check shall be made on the sky wave signal of other stations to determine the general conditions of propagation while such measurements are taken.[13]

In computing the distance to the 50 per cent sky wave field intensity contour of a Class I Station of a given power, and also in computing the 10 per cent sky wave field intensity of an alleged interfering station, of any class and given power, at a specified distance, use shall be made of the appropriate graphs set forth in Figure 1 entitled "Average Skywave Field Intensity" (corresponding to the second hour after sunset at the recording station). The curves are drawn for an effective field of 100 millivolts per meter at one mile.

The distance to any specified ground wave field intensity contour may be determined from appropriate ground wave curves plotted for the frequency under consideration and the conductivity and dielectric constant of the earth between the station and desired contour. The frequency and the conductivity of the earth must be considered in every case and where the distance is great due allowance must be made for loss due to curvature of the earth. Figure 2 entitled "Groundwave Field Intensity" drawn for a frequency of 1000 kc, conductivity of 10^{-13}, dielectric constant 15, and an effective field of 100 millivolts per meter at one mile, may be employed when applicable.

Table VI gives the required day separation in miles between broadcast stations on the same channel. Table VII gives the required separation in miles between broadcast stations on adjacent channels during both daytime and nighttime. Table VIII gives the required night separation in miles between broadcast stations operating on the same channel. The assumed conditions of operation are given on the first page of the tables.

The tables are based upon the use of nondirective antennas but, in case a directive antenna is employed at a particular station, it will be necessary to consider the radiation distribution of the directional antenna involved and to modify the mileage separation accordingly.[14] [15]

The night separation tables for stations on the same frequency are computed from the sky wave curve given in Figure 1. These curves are based on extensive measurements of the sky wave produced by broadcasting stations and shall be considered as accurate in all cases unless proof to the contrary is supplied. Such proof must be based on field intensity measurements taken in accordance with requirements set out in Annex III and must show what condition prevails that causes the signal to depart from the average.

The mileage separation tables for the same channel during daytime and for adjacent channels day and night are computed from the ground wave curves in Figure 2. These tables apply only in case the frequency is 1000 kc and the assumed soil conductivity and dielectric constant prevail. Since these values vary in every case the tables for daytime and adjacent channel separation cannot be used except as a general guide. In any case under consideration an estimate of the mileage separation required may be made from the operating frequency and known or assumed soil conditions.[16]

TABLE IV.—*Protected Service Contours and Permissible Interference Signals for Broadcast Stations*

Class of station	Class of channel used	Permissible power	Signal intensity contour of area protected from objectionable interference [1]		Permissible interfering signal on same channel [2]	
			Day [4]	Night	Day [4]	Night [3]
Ia	Clear	50 kw	SC 100 uv/m AC 500 uv/m	Not duplicated	5 uv/m	Not duplicated.
Ib	Clear	10 kw to 50 kw	SC 100 uv/m AC 500 uv/m	500 uv/m (50% sky wave).	5 uv/m	25 uv/m.
II	Clear	0.25 kw to 50 kw	500 uv/m	2500 uv/m [5] (ground wave).	25 uv/m	125 uv/m.[5]
III-A	Regional	1 kw to 5 kw	500 uv/m	2500 uv/m (ground wave).	25 uv/m	125 uv/m.
III-B	Regional	0.5 to 1 kw night and 5 kw day.	500 uv/m	4000 uv/m (ground wave).	25 uv/m	200 uv/m.
IV	Local [6]	0.1 kw to 0.25 kw	500 uv/m	4000 uv/m (ground wave).	25 uv/m	200 uv/m.

SC=Same channel.
AC=Adjacent channel.

[1] When it is shown that primary service is rendered by any of the above classes of stations, beyond the normally protected contour, and when primary service to approximately 90% of the population (population served with adequate signal) of the area between the normally protected contour and the contour to which such station actually serves, is not supplied by any other station or stations, the contour to which protection may be afforded in such cases will be determined from the individual merits of the case under consideration. When a station is already limited by interference from other stations to a contour of higher value than that normally protected for its class, this contour shall be the established standard for such station with respect to interference from all other stations.

[2] For adjacent channels see Table II.

[3] Sky wave field intensity for 10% or more of the time.

[4] Ground wave.

[5] These values are with respect to interference from all stations except Class Ib, which stations may cause interference to a field intensity contour of higher value. However, it is recommended that Class II stations be so located that the interference received from Class Ib stations will not exceed these values. If the Class II stations are limited by Class Ib stations to higher values, then such values shall be the established standard with respect to protection from all other stations.

[6] Class IV stations may also be assigned to regional channels according to Section 3.29.

TABLE V.— *Adjacent Channel Interference*

Channel separation between desired and undesired stations:	*Maximum ground wave field intensity of undesired station*
10 kc	0.25 mv/m.
20 kc	5.0 mv/m.
30 kc	25.0 mv/m.

The undesired ground wave signal shall be determined at or within the 0.5 mv/m ground wave contour of the desired station. These values apply to all classes of stations both day and night and are based on ground waves which hold for an effective power up to 50 kw. Above this effective power, when an interfering sky wave signal for 10 per cent or more of the time exceeds five times the desired signal 10 kc removed in frequency (or undesired exceeds 25 times the desired signal 20 kc removed in frequency), interference will be produced. This may result from the use of a directional antenna and in such cases the interference shall be determined from the 10% sky wave of an interfering station to the normally protected ground

[13] See Annex II for further discussion and solution of a typical directional antenna case.

[13] See Annex III for detailed requirements and also Section on "Field Intensity Measurements in Allocation."

[14] See Annex II for method of modification.

[15] The Commission will not authorize a directive antenna for a Class IV Station assigned a local channel.

[16] See Annex I for a determination of interference from ground waves when actual measurements are not available.

wave or to a sky wave of a desired station, on the basis of a ratio of 1 to 5 (or 1 to 25 for 20 kc) for desired signal to the undesired sky wave signal for 10 per cent or more of the time.

The mileages given in Table VII are based on ground waves only and do not apply for night operation where the 10 per cent sky wave of an undesired station exceeds five times (or 25 times for 20 kc) the normally protected field intensity of a desired station.

Mileage Separation Tables

The required mileage separations between broadcasting stations as tabulated below are based upon the following conditions:

1. The use of nondirectional antennas in the horizontal plane and the vertical pattern of a 0.311 wavelength antenna.
2. Effective field in mv/m at one mile for one kilowatt.

Class I—225 mv/m.
Class II and III—175 mv/m.
Class IV—150 mv/m.

3. Frequency, 1000 kc.
4. Soil conductivity, $s=10^{-13}$.
5. Soil dielectric constant, $e=15$.
6. Ground wave transmission as shown on chart in Figure 2.
7. Sky wave transmission as shown on chart in Figure 1.
8. Protection to service areas as shown in Table IV.
9. Ratio of desired to undesired signal:

Channel separation:	*Ratio of desired to undesired*
Same frequency	20:1 ground wave or 10% skywave.
Synchronized carriers	4:1.[1]

[1] Two stations are considered to be operated synchronously when the carriers are maintained within one-fifth of a cycle per second of each other, either automatically or manually and they transmit the identical program. While observations have been made on several synchronized stations, no definite standards as to ratio of desired carrier to undesired carriers have been established, inasmuch as the methods of operations have not been standardized and results vary appreciably. From the observations it would appear that for most types of synchronous operation a ratio of about four to one between desired and undesired carriers is necessary to avoid distortion. This ratio holds only when the audio modulation is in sufficiently close time phase to avoid echo effects. In computing the interference in the primary service areas between the ground waves of two synchronously operated stations the ratio of four to one should be used. No complete information is available as to the required ratio between skywaves; however, it would appear that a ratio less than four to one can be tolerated without objectionable interference, first because the standard of acceptance of a signal as satisfactory is lower for secondary service and second, because several waves with random relative phases usually make up each skywave and the combination of two such synchronized waves generally causes less distortion. Synchronous operation of two or more stations may enable an extension of the coverage and service on a channel without any material increased interference range beyond that one station would produce.

Channel separation:	*Ratio of desired to undesired*
10 kc	2:1 ground wave.[1] 1:5 sky wave.
20 kc	1:10 ground wave. 1:25 sky wave.
30 kc	1:50.
40 kc and above	No restriction.[2]

[1] This ratio of desired to undesired signal is not based on the characteristics of the average receiver but upon what the characteristics of an ideal receiver would be which would permit high fidelity reception of a station in the high fidelity primary service area (primary area where no interference would be caused to a receiver responding faithfully to a band 15 kc wide or 7.5 kc audio response). The ratio of desired to undesired (1 to 5 and 1 to 25) for interference from a sky wave 10 and 20 kc removed in frequency respectively is based on the characteristics of most good receivers placed in operation since 1936 and operated as most listeners adjust variable selectivity receivers where the signal is one millivolt or less.

[2] Two stations, one with a frequency twice that of the other, should not be assigned in the same primary service area unless special precautions are taken to avoid interference from the second harmonic of the lower frequency.

10. Service and Interference Radii—Night.

Class—Power and field at mile	Service radii			Interference radii		
	2.5 mv/m G.W.	4.0 mv/m G.W.	500 uv/m 50% S.W.	200 uv/m 10% S.W.	125 uv/m 10% S.W.	25 uv/m 10%
Class IV						
100 w:						
47.5 mv/m		8.5		G.W.	190	
250 w:						
75 mv/m		11.5		G.W.	370	
Class III						
500 w:						
124 mv/m		15		380	590	
1000 w:						
175 mv/m	25	20		535	710	
5 kw:						
392 mv/m	39			840	1000	
Class II						
250 w:						
87.5 mv/m	17			210	440	1040
500 w:						
124 mv/m	21			330	590	1170
1000:						
175	25			535	710	1325
5 kw:						
392	39			840	1000	1840
10 kw:						
554	42			960	1125	2120
25 kw:						
875 mv/m	56			1120	1320	2570
50 kw:						
1238 mv/m	65			1265	1510	
Class I						
10 kw:						
712 mv/m			345	1045	1225	2345
25 kw:						
1125 mv/m			575	1225	1460	
50 kw:						
1592 mv/m			715	1395	1685	

G. W.=Ground wave. S. W.=Sky wave.

TABLE VI.—*Required Day Separation in Miles Between Broadcast Stations on the Same Channel*[1]

Class and power	Class IV		Classes II and III							Class I		
	100 w	250 w	0.25 kw	0.5 kw	1 kw	5 kw	10 kw	25 kw	50 kw	10 kw	25 kw	50 kw
Class IV												
100 w	143	165	172	192	213	265	285	310	335	390	417	437
250 w	165	173	180	200	221	273	293	318	343	415	442	462
Classes II and III												
0.25 kw	172	180	183	203	224	276	296	321	346	418	446	465
0.5 kw	192	200	203	210	231	283	303	328	353	446	473	493
1 kw	213	221	224	231	239	291	311	336	361	467	494	514
5 kw	265	273	276	283	291	313	333	358	383	520	547	567
10 kw	285	293	296	303	311	333	345	370	395	540	567	587
25 kw	310	318	321	328	336	358	370	389	414	565	592	612
50 kw	335	343	346	353	361	383	395	414	430	587	614	634
Class I												
10 kw	390	415	418	446	467	520	540	565	587	556	585	605
25 kw	417	442	446	473	494	547	567	592	614	585	612	632
50 kw	437	462	465	493	514	567	587	612	634	605	632	652

[1] See discussion page 1.8 before using in any specific case.

TABLE VII.—*Required Day and Night Separation in Miles Between Broadcast Stations on Adjacent Channels* [1]

Class and power	Class IV						Classes II and III														
	0.1 kw			0.25 kw			0.25 kw			0.5 kw			1 kw			5 kw			10 kw		
	10 kc	20 kc	30 kc	10 kc	20 kc	30 kc	10 kc	20 kc	30 kc	10 kc	20 kc	30 kc	10 kc	20 kc	30 kc	10 kc	20 kc	30 kc	10 kc	20 kc	30 kc
Class IV																					
0.1 kw	73	37	32	82	45	40	86	47	42	94	55	50	105	63	58	133	84	79	149	98	93
0.25 kw	82	45	40	90	48	41	94	50	43	102	58	51	113	66	59	141	87	80	157	101	94
Classes II and III																					
0.25 kw	86	47	42	94	50	43	96	51	43	104	59	51	115	67	59	143	88	80	159	102	94
0.5 kw	94	55	50	102	58	51	104	59	51	112	62	52	123	70	60	151	91	81	167	105	95
1 kw	105	63	58	113	66	59	115	67	59	123	70	60	131	73	62	159	94	83	175	108	97
5 kw	133	84	79	141	87	80	143	88	80	151	91	81	159	94	83	180	104	87	196	118	101
10 kw	149	98	93	157	101	94	159	102	94	167	105	95	175	108	97	196	118	101	210	123	104
25 kw	172	115	110	180	118	111	182	119	111	190	122	112	198	125	114	219	135	118	233	140	121
50 kw	190	131	126	198	134	127	200	135	127	208	138	128	216	141	130	237	151	134	251	156	137
Class I																					
10 kw	162	107	102	170	110	103	172	111	103	180	114	104	188	117	106	209	127	110	223	132	113
25 kw	183	126	121	191	129	122	193	130	122	201	133	123	209	136	125	230	146	129	244	151	132
50 kw	203	144	139	211	147	140	213	148	140	221	151	141	229	154	143	250	164	147	264	169	150

[1] See discussion, before using in any specific case.

Class and power	Class II						Class I								
	25 kw			50 kw			10 kw			25 kw			50 kw		
	10 kc	20 kc	30 kc	10 kc	20 kc	30 kc	10 kc	20 kc	30 kc	10 kc	20 kc	30 kc	10 kc	20 kc	30 kc
Class IV															
0.1 kw	172	115	110	190	131	126	162	107	102	183	126	121	203	144	139
0.25 kw	180	118	111	198	134	127	170	110	103	191	129	122	211	147	140
Classes II and III															
0.25 kw	182	119	111	200	135	127	172	111	103	193	130	122	213	148	140
0.5 kw	190	122	112	208	138	128	180	114	104	201	133	123	221	151	141
1 kw	198	125	114	216	141	130	188	117	106	209	136	125	229	154	143
5 kw	219	135	118	237	151	134	209	127	110	230	146	129	250	164	147
10 kw	233	140	121	251	156	137	223	132	113	244	151	132	264	169	150
25 kw	250	149	125	268	165	141	242	145	123	261	160	136	281	178	154
50 kw	268	165	141	284	172	145	260	161	139	279	163	144	297	185	158
Class I															
10 kw	242	145	123	260	161	139	232	137	115	253	156	134	273	174	152
25 kw	261	160	136	279	168	144	253	156	134	272	163	139	292	181	157
50 kw	281	178	154	297	185	158	273	174	152	292	181	157	310	190	161

TABLE VIII.—*Required Night Separation in Miles Between Broadcast Stations on the Same Channels*

The following tables indicate the mileage protection each class must give all other classes.

TABLE VIII–A

Class Ia should protect Class II stations as shown:

Class Ia:	*Class II—All Powers*
50 kw	Not duplicated at night.

TABLE VIII–B

Class Ib should protect other Class Ib stations as shown below.

Class Ib	Class Ib		
	10 kw	25 kw	50 kw
10 kw	2665	3010	----------
25 kw	3010	(1)	(1)
50 kw	----------	(1)	(1)

[1] Cannot be duplicated without directional antenna and then this Table does not apply.

TABLE VIII–C

Class II should protect other classes as shown below—non-directional antenna.

Class II	Class II							Class Ib		
	0.25 kw	0.5 kw	1 kw	5 kw	10 kw	25 kw	50 kw	10 kw	25 kw	50 kw
0.25 kw	455	[1] 460	465	480	485	495	505	1,385	1,615	1,755
0.5 kw	605	610	615	630	635	645	655	1,515	1,745	1,885
1 kw	725	730	735	750	755	765	775	1,670	1,900	2,040
5 kw	1,015	1,020	1,025	1,040	1,045	1,055	1,065	2,185	2,415	2,555
10 kw	1,140	1,145	1,150	1,165	1,170	1,180	1,190	2,465	2,695	2,835
25 kw	1,335	1,340	1,345	1,360	1,365	1,375	1,385	2,915	3,145	--------
50 kw	1,525	1,530	1,535	1,550	1,555	1,555	1,575	--------	--------	--------

[1] The mileages in the upper right-hand half of this Section of this Table do not provide for protection to the lower power Class II station. Thus, if a 0.25 kw Class II station operated 460 miles from a 0.5 kw Class II station, it would receive interference to greater than the 2.5 mv/m ground wave contour unless the 0.5 kw Class II station used an appropriate directional antenna.

TABLE VIII–D

Class III–A should protect other classes as shown below.

Class III–A	Class III–A		Class III–B	
	1 kw	5 kw	0.5 kw	1 kw
1 kw	735	750 [1] 1,025	550	555 735
5 kw	1,025	1,040	855	860

[1] Where double figures are given, the lower and larger figure is the mileage required to protect the station in the left hand column to its normally protected contour.

TABLE VIII–E

Class III–B should protect other classes as shown below.

Class III–B	Class III–A		Class III–B	
	1 kw	5 kw	0.5 kw	1 kw
0.5 kw	615	630 [1] 855	395	400 550
1 kw	735	750 860	550	555

[1] Where double figures are given, the lower and larger figure is the mileage required to protect the station in the left hand column to its normally protected contour.

TABLE VIII–F

Class IV should protect other classes as shown below.

Class IV	Class III–A		Class III–B		Class IV	
	1 kw	5 kw[1]	0.5 kw	1 kw	0.1 kw	0.25 kw
0.1 kw	[2] 300	[2] 300	(3)	(3)	(3)	(3)
0.25 kw	395	410	(3)	(3)	(3)	(3)

[1] Where double figures are given, the lower and larger figure is the mileage required to protect the station in the left hand column to its normally protected contour.
[2] The distance based on the minimum practical values.
[3] Daytime separation determines.

TABLE VIII–G

Distance Class II Stations should be from Class Ib Stations to obtain recommended protection to Class II Station (2.5 mv/m ground wave contour).

Class II[1]	Class Ib		
	10 kw.	25 kw.	50 kw.
0.25 kw	1240	1475	1700
0.5 kw	1245	1480	1705
1 kw	1250	1485	1710
5 kw	1265	1500	1725
10 kw	1265	1505	1730
25 kw	1280	1515	1740
50 kw	1290	1525	1750

[1] The Class II Station should use a directional antenna to protect dominant station or stations with these separations.

TABLE VIII–H

Distance Class IV Stations should be from Class III–A and III–B Station to obtain recommended protection to Class

IV Station (4.0 mv/m ground wave contour).

Class IV—Power	Class III-A or III-B		
	0.5	1.0	5.0
0.10	388	543	850
0.25	391	546	852

ANNEX I

Interference From Ground Wave Signals

Interference that may be caused by a proposed assignment or an existing assignment during daytime should always be determined, when possible, by measurements on the frequency involved or on another frequency over the same terrain and by means of the curves in Figure 4, interpolate for the desired frequency.

In determining the interference from field intensity measurements, two general steps are necessary: First, establish the outer boundary of the protected service area of the desired station in the direction of the station that may cause interference with it. Second, at this boundary, measure the interfering signal from the undesired station. The ratio of the desired to the undesired signal given on the first page of the separation should be applied to the measured signals and if the required ratio is observed, then no interference is contemplated. The effective field of the antenna in the pertinent directions of the stations must be established and all measurements must be made in accordance with the section on "Field Intensity Measurements in Allocation."

In all cases where measurements taken in accordance with the requirements are not available,[17] the ground wave intensity must be determined by means of the conductivity of the terrain and the ground wave curves of field intensity vs. distance. The conductivity of a given terrain may be determined by measurements of any broadcast signal traversing the terrain involved or in case such measurements are not available, then conductivity must be taken from the map of ground conductivity in the United States, Figure 3. This map shows the conductivity throughout the entire United States by general areas of reasonably uniform conductivity. In areas of limited size, or over a particular path, the conductivity may vary widely from the values given. This map is to be used only when accurate and acceptable measurements have not been made.

If an interfering signal traverses areas for which more than one conductivity is given by the map, then conductivity for ⅔ the distance should be taken and in case this involves more than one value, then the highest predominating value should be assumed to prevail. Where the conductivity along a given path varies over wide limits the previous method may give erroneous results in which case the signal at any given point for a given value of field intensity at one mile from the antenna in the direction concerned may be determined by determining and adding the attenuation in decibels of each section of the intervening path.[18]

Figure 4 gives the ground wave field intensity curves with field intensity plotted against distance for various values of conductivity and by blocks of frequencies. To cover the standard broadcast band some 20 graphs in all are required and are attached as Appendix II. In all cases the curves are plotted on the basis of 100 mv/m effective field at a mile. An example of determining the interference by this method follows:

It is desired to find the interference that a 5 kw Class III station on 920 kc may cause to a 1 kw Class III station on 930 kc. The stations are separated by 175 miles. It is assumed that both stations use non-directional antennas[19] having such height as to produce an effective field for 1 kw of 175 mv/m.[20] From Figure 3, the conductivity at each station and intervening terrain is determined as $6\times10-14$. The protection to Class III during daytime is to the 500 uv/m contour. The distance to the 500 uv/m ground wave contour of the 1 kw station is determined by the use of the curves in Figure 4 as being 44 miles. Since these curves are plotted for 100 mv/m at a mile to find the distance to the 500 uv/m contour of the 1 kw station, it is necessary to determine the distance on the appropriate curve to the

$$\left(\frac{100\times500}{175}=285\right)$$

285 uv/m contour. Thus, the estimated radius of the service area for the desired station is established as 44 miles. Subtract this distance from the distance between the two stations leaving 131 miles for the interfering signal to travel. Again from the appropriate curve in Figure 4 it is found that the signal from the 5 kw station at this distance would be 96 uv/m. Since the stations are separated by 10 kc the undesired signal at that point can have a value up to 250 uv/m without interference, but if the interference signal had been found to be greater than this value, then interference would have been determined. For other channel separations the appropriate ratio of desired to undesired signal would have been used. This principle holds for all cases except where a sky wave signal 10 per cent or more of the time from the undesired station is in excess of 5 times the desired signal when the frequency separation is 10 kc or 25 times when the frequency separation is 20 kc. In this case the interference must be estimated on the basis of the sky wave interference and the propagation curve in Figure 1 used to determine the interfering signals rather than Figure 4 for the ground wave signals.

ANNEX II

Computation on Interfering Signal from a Directional Antenna

In case of an antenna directional in the horizontal plane, the ground wave interference can be readily computed from the calculated horizontal pattern by determining the vectors toward the service area of the station to be protected and apply these values to the ground wave curves set out in Annex I.

In case of determining sky wave interference from an antenna with a vertical pattern different from that on which Figure 1 is predicated (the basis of the night mileage separation tables) it is necessary to compare the appropriate vectors in the vertical plane.

The sky wave curves entitled "Average Sky Wave Field Intensity" (corresponding to the second hour after sunset at the recording station) as shown in Figure 1 are based on antenna systems having height of 0.311 wave length (112°) and producing a vertical pattern as shown at Figure 5. A nondirectional antenna system as well as a directional antenna system having vertical patterns other than essentially the same as shown, must be converted to the pattern of an 0.311 wave length antenna having the same field intensity at the critical angle as does the pattern of the antenna involved. Example:

Figure 6 is a graph entitled "Variation with Distance of Two Important Parameters in the Theory of Sky Wave Propagation." The curve for θ showing the angle above the horizon at which radiation occurs plotted against distance, must be used for this purpose. For instance, assuming the station with which interference may be expected is located at a distance of 450 miles from a proposed station, the critical angle of radiation as determined from this curve is approximately 15°. Therefore, if the vertical pattern of the proposed station in the direction of the other station is such that at 15° above the horizon the radiation is 1.3 times that from an antenna having a vertical pattern as shown at Figure 5 and producing the same field intensity at one mile in the horizontal

[17] The Commission will *not* authorize operation on a proposed assignment for the purpose of making measurements.

[18] For example, assuming three values of conductivity prevail such that for the frequency and distances concerned the signal is attenuated over the given conductivities 6, 8, and 14 db respectively or a total of 28 db over the entire path, then the signal at the point concerned for 100mv/m at one mile would be $\frac{100}{25.119\ (\text{voltage ratio for 28 db})}$, or 3.98 mv/m.

[19] See Annex II in case of use of directional antennas.

[20] In all cases the effective field should be established from the dimensions of the radiating system. The value assumed here is in accordance with Section 3.45 and the Standards of Good Engineering Practice promulgated pursuant thereto.

plane, the interfering signal would be 1.3 times that determined from Figure 1 for an antenna having the same field intensity in the horizontal plane. That is, if the field intensity in the horizontal plane of the proposed station is 124 mv/m, the interfering field intensity exceeded 10% of the time at the other station would be $140 \times 1.30 \times \frac{124}{100}$ or 225 uv/m and would cause interference to the 4.5 mv/m ground wave contour of the existing station.

When the distance is large, more than one reflection may be involved and due consideration must be given each appropriate vector in the vertical pattern as well as the constants of the earth where reflection takes place between the transmitting station and the service area to which interference may be caused.

ANNEX III

Interference From Sky Wave Signals

Set out below is the detailed method of making measurements of the sky wave signals to determine an interfering signal for 10 per cent of the time.

The signal must be received on an approved field intensity meter duly calibrated and recorded on a continuous recording meter of suitable accuracy and sensitivity. Measurements at distances less than 350 miles from the station should be made with a vertical antenna only. At greater distances either a vertical antenna, loop, or other suitable antenna may be used. Two complete recording units are required so that two signals can be recorded simultaneously.

A monitor station on which interference free measurements can be made must be selected for simultaneous recordings. This station should be in the general direction of the principal station to be recorded. Preferably such monitor station should have known antenna characteristics and the conductivity of the surrounding terrain should be known. The transmitters should be located in the same general area and the frequencies of the stations as close as possible. The reception of the two stations should be on the same antenna or on antennas in the same area so that both are influenced by the same surrounding objects.

Recordings may be made on both stations from sundown over the entire path until midnight at the recording station. These records should be analyzed for each night and for the entire period of recording and graphs drawn which show field intensity versus per cent time. The 10 per cent signal determined for the principal station for the entire period must be modified by a propagation factor determined from a comparison of the 10 per cent signal from the monitor station to the value determined from the 10 per cent curve of Figure 1 for the same distance, power, and pertinent antenna characteristic. Thus, if the 10 per cent signal from the Figure 1 10 per cent curve is 500 uv/m and the measured 10 per cent signal on the monitor station 350 uv/m, then the 10 per cent signal from the principal station should be increased by 45 per cent to determine the interfering signal. Recordings for at least 10 nights are required. If it is not practical to follow this procedure, due to interference to the reception of the principal station recorded, the following procedure is required:

Record the monitor station beginning one and one-half hours, to within fifteen minutes, after sundown over the entire path and continue recording for one hour. Then record the monitor station and the principal station during the earliest later hour that the principal station can be recorded. The measurements on the principal station must be for at least one hour each night and preferably not less than two hours each night. In all cases the monitor station must be recorded simultaneously. These measurements must be taken for at least 10 nights. Establish the 10 per cent value of the field during the second hour and also the 10 per cent value of both stations during the period when both are measured. The 10 per cent value of the field for the principal station must be corrected in the following manner:

First: Compare the 10 per cent value of the signal for the monitor station during the second hour after sunset with the 10 per cent value determined from Figure 1 for the same distance and reduce to the same power for comparable radiation at the appropriate angle. This establishes the propagation factor which assume is found to be 30 per cent low for the nights of recordings.

Second: Compare the signal on the monitor station during simultaneous operation with the value during the second hour after sunset and obtain the correction for difference in propagation between the second hour and the actual time of measuring the principal station. Thus, a time factor is established by which the actual value of the field intensity on the principal station is to be further modified. If the propagation factor is 30 per cent low and the time factor 70 per cent high, the actual readings on the principal station would be first decreased by 70 per cent and then the result increased by 30 percent. The value obtained in this way is to be considered the interference value of signals for use in all allocation problems.

When it is claimed that the propagation over the path involved is normally less than the average, measurements must be made on two or more other stations of different paths for at least 30 days and the signals of all stations involved recorded in the above manner to establish that propagation conditions in general were normal and that the path under consideration was low as claimed due to some natural conditions. A full explanation of the theory or practical findings must be made.

In all other cases where the signal is substantially greater or less than the average determined from Figure 1, complete information must be supplied as to why the signal measured has departed from the average. If the reason this condition is based on the location of the antenna, its characteristics, the conductivity of the surrounding area or other natural limitations, a full explanation of the nature and character of such conditions must be supplied and also information as to whether the licensee could by moving its station or by making other changes within its control alter the situation so that the abnormal condition of propagation would no longer exist.

The interference signal determined by the above methods should be used to determine interference to a station in the same manner as the ground wave signals were employed as set out in Annex I. These methods of measurement should be used to determine skywave service signal for 50 per cent of the time.

2. FIELD INTENSITY MEASUREMENTS IN ALLOCATION

A. Field Intensity Measurements to Establish Effective Field Intensity at One Mile

Section 3.45 provides that certain mininmum field intensities are acceptable in lieu of the required minimum physical vertical heights of the antennas proper. Also in other allocation problems, it is necessary to determine the effective field at one mile. The following requirements shall govern the taking and submission of data on the field intensity produced:

Beginning as near to the antenna as possible without including the induction field and to provide for the fact that a broadcast antenna not being a point source of radiation (not less than one wave-length or five times the vertical height in the case of a single element, i. e. nondirectional antenna or 10 times the spacing between the elements of a directional antenna), measurements shall be made on eight or more radials, at intervals of approximately one-tenth mile up to two miles from the antenna, at intervals of approximately one-half mile from two miles to six miles from the antenna, at intervals of approximately two miles from six miles to 15 or 20 miles from the antenna, and a few additional measurements if needed at greater distances from the antenna. Where the antenna is rurally located and unobstructed measurements can be made, there shall be as many as 18 or 20 measurements on each radial. However, where the antenna is located in a city where unobstructed measurements are difficult to make, measurements shall be made on each radial at as many unobstructed locations as possible even though the intervals are considerably less than stated above, particularly within two miles of the antenna. In cases where it is not possible to obtain accurate measurements at the closer distances (even out to 5 or 6 miles due to the character

of the intervening terrain), the measurements at greater distances should be made at closer intervals.[21]

These data should be plotted for each radial in accordance with either of the two methods set forth below:

1. Using log-log coordinate paper plot field intensities as ordinate and distance as abscissa.

2. Using semi-log coordinate paper plot field intensity times distance as ordinate on the log scale and distance as abscissa on the linear scale.

However, regardless of which of these methods is employed, the proper curve to be drawn through the points plotted shall be determined by comparison with theoretical curves as follows: Plot theoretical curves (see paper by Mr. K. A. Norton, October 1936, Proc. I.R.E.) for several values of conductivities and dielectric constants, approximating the conductivity and dielectric constants indicated by the measurements on another sheet of the same coordinate paper. Place this sheet over the sheet on which the actual points have been plotted, hold to the light if necessary and adjust until the curve most closely matching the points is found. This curve should then be drawn on the sheet on which the points were plotted together with the inverse distance curve corresponding to that curve. The field at one mile for the radial concerned shall be the ordinate on the inverse distance curve at one mile.

When all radials have been analyzed in this manner, a curve shall be plotted on polar coordinate paper from the fields obtained, which gives the inverse distance field pattern at one mile. The radius of a circle, the area of which is equal to the area bounded by this pattern, is the effective field. (See Section 3.16.)

While making the field intensity survey, the output power of the station shall be maintained at the licensed power as determined by the direct method. To do this it is necessary to determine accurately the total antenna resistance (the resistance variation method, the substitution method or bridge method is acceptable) and to measure the antenna current by means of an ammeter of acceptable accuracy.[22]

Complete data taken in conjunction with the field intensity measurements shall be submitted to the Commission in affidavit form including the following:

1. Tabulation by number of each point of measurement to agree with the map required in (2) below and the field intensity meter reading, the attenuation constant, the field intensity (E), the distance from the antenna (D) and the product of the field intensity and distance (ED) (if data for each radial is plotted on semi-logarithmic paper, see above) for each point of measurement.

2. Map showing each point of measurement numbered to agree with tabulation required above.

3. Description of method used to take field intensity measurements.

4. The family of theoretical curves used in determining the curve for each radial properly identified by conductivity and dielectric constants.

5. The curves drawn for each radial and the field intensity pattern (see subsection B 5 a, b and c).

6. Antenna resistance measurement:

a. Antenna resistance at operating frequency.

b. Description of method employed.

c. Tabulation of complete data.

d. Curve showing antenna resistance versus frequency.

7. Antenna current or currents maintained during field intensity measurements.

8. Description, accuracy, date and by whom each instrument was last calibrated.

9. Name, address and qualifications of the engineer making the measurements.

10. Any other pertinent information.

B. Field Intensity Measurements to Establish Performance of Directional Antennas

Section 3.33 (b) requires that proof of performance of directional antenna systems be submitted before any operation during the regular broadcast day may be permitted. These data shall be taken upon proper request and authorization therefor during the experimental period and shall show that the pattern obtained is essentially the same as that predicted by the application and required by terms of the authorization and that any specific requirements set out are fully met.

To establish this performance measurements shall be made in accordance with the preceding Section A along sufficient number of radials to establish the effective field from the antenna system. In the case of a relatively simple directional antenna pattern, approximately eight radials in addition to the radials in the directions the field intensity values are specified by the authorization are sufficient. However, when more complicated patterns are involved, that is, patterns having several or sharp lobes or nulls, measurements shall be taken along as many additional radials as necessary to definitely establish the pattern.

In cases where the authorization requires a showing that actual field intensities of specified values be obtained in the various portions of the service area, sufficient measurements throughout these areas shall be made to show that at least the values specified are obtained. (See Paragraph 2d of this section.)

In either of the above cases the following information shall be submitted in triplicate even though such information was submitted with the original application:

1. Complete description of antenna array.

a. Number of elements.

b. Manufacturer's name and type of each element (i. e., guyed or self-supporting, triangular or square, uniform cross-section or tapered, etc.).

c. If top loaded, give details.

d. Height of vertical lead of each element in feet (height above base insulator or base, if grounded).

e. Overall height in feet of each element above ground level.

f. Overall height in feet of each element above mean sea level.

g. Orientation of array with respect to true north and time (specify degrees leading or lagging) and space phasing of elements. (Space phasing should be given in feet as well as in degrees.)

h. Details of ground system for each element (length and number of radials, dimensions of ground screen, if used, and depth buried).

i. Current in each element (at point where antenna ammeter is located) and current and resistance at point of common input to the antenna system.[1]

j. Schematic sketch and description of method of feeding power to elements, including phasing and coupling equipment and locations of antenna ammeters (both regular, point of common input and remote) in the circuits.

k. If not fully described above, give complete details and sketches if needed.

l. Full description of painting and lighting installed on each element.

m. If phase monitor is employed state phase readings (specifying whether leading or lagging) and ratio of current indications for each element.[2]

2. Horizontal field intensity patterns for each power involved showing:

a. Directional Field Intensity at one mile and effective field intensity from the antenna determined from the field intensity measurements as set forth above.

b. Direction true north shall be shown at zero azimuth.

c. Direction of each station or city specified in the instrument of authorization in which direction a limiting field was specified and the actual field intensity obtained in each of such directions (all directions shall be determined by accurate calculation or from Lambert Conformal Conic Projection Map such as

[21] It is suggested that "Wave Tilt" measurements may be made to determine and compare locations for taking field intensity measurements, particularly to determine that there are no abrupt changes in ground conductivity or that reflected waves are not causing abnormal intensities.

[22] See Section 3.54 and "Further Requirements for Direct Measurement of Power" and "Indicating Instruments Pursuant to Section 3.58."

[1] See "Further Requirements for Direct Measurement of Power" and "Construction, General Operation and Safety of Life Requirements."

[2] See "Indicating Instruments Pursuant to Section 3.58."

U. S. Coast and Geodetic Survey Map No. 3060, a, or map of equal accuracy, and all distances shall be determined by accurate calculation or from U. S. Albers Equal Area Projection Map, Scale $\frac{1}{2,500,000}$ or map of equal accuracy. These may be obtained from the United States Coast and Geodetic Survey and from the United States Department of Interior, Geological Survey, for the sums of forty cents and one dollar, respectively).

d. Actual field intensity contours for 25, 10 and 5 mv/m and any other contours specified by the instrument of authorization on a map having the largest practical scale. These contours need not be shown for distances over 15 miles from the antenna except that the field intensity contours on the far sides of the business and residential areas of the city in which the main studio is located shall be shown. This does not waive the requirement for measurements at greater distances under A above.

3. Complete tabulation of all data used in plotting the above patterns.

4. Any other pertinent information.

5. Plotting of field intensity patterns:

a. All patterns shall be plotted on standard letter-size polar co-ordinate paper (main engraving approximately 7'' x 10'').

b. All patterns shall be plotted to the largest scale possible on the paper specified in (a) above using divisions and subdivisions having values of 1, 2, 2.5 or 5 times 10^x. (No other values shall be used.)

c. All values of field intensity less than 10 percent of the r. m. s. field intensity of the pattern shall be shown on an enlarged scale in accordance with (a & b) above.

As a check on the shape of the field intensity pattern obtained in accordance with the above it is suggested that measurements be taken on each of the radials at approximately one mile from the antenna system for operation, both directional and non-directional and the ratios of these values plotted on polar coordinate paper in accordance with the above specifications.

C. *Measurement of the Field Intensity of Broadcast Stations for Presentation in Support of Applications or Evidence at Hearings Before the Commission*

Section 3.24 requires that among other things an application for a new standard broadcast station or increase in facilities of an existing station make a satisfactory showing that objectionable interference will not be caused to an existing station or stations.

In the determination of such interference in accordance with section 3.28 actual measurements will take precedence over theoretical values provided such measurements are properly taken and presented.

When measurements of either ground wave signal intensity or sky wave signal intensity are presented in evidence, they shall be supported by a field intensity survey of the station observed, which survey should be sufficiently complete in accordance with Sections A and B above to determine the field at one mile in the pertinent directions for that station.

When measurements are made on sky wave signal intensity (either service or interference) they shall be graphic recordings as follows:

1. Recordings shall be made on 10 or more nights for sufficient periods each night to obtain reasonable average values.[22]

2. Observations shall be made on other stations to determine whether sky wave transmission conditions are of propagation.

3. Scales on the graphic paper shall be such as to permit easy reading of both time and field intensity and calibration shall be clearly indicated.

4. Pertinent notes such as predominance of signal of a certain station when recording composite signals shall be made on the recording.

5. Full description shall be given the point where recordings were made (geographically as well as field intensity of the station to which interference is being determined).

6. Full explanation of to what extent signals from other stations on the same channel affected the accuracy of the recordings and what steps, if any, were taken to eliminate or compensate for such signals.

If the observed station is owned or controlled by the party on whose behalf the measurements are made, then, in addition to the above, detail reports on the measurement of the antenna resistance and on the amount of power actually radiated (as determined by the direct method) during the course of the field intensity measurements shall be presented. The applicant (or participant) shall also furnish a complete description of the antenna and ground system in use at the transmitting station during the period of observations and a statement as to whether or not this is the identical equipment regularly used by the station.

When measurements of both the "desired" and "undesired" station are made in one area to determine the point where objectionable interference from ground wave signals occurs, several measurements of each station shall be made within a few miles of the point where the ratio of signals is that selected as the appropriate ratio for the determination of objectionable interference.

All information on the above, including description and accuracy of equipment used, when and by whom last calibrated, and the name and qualifications of the engineer making the measurements, when filed with an application, shall be in affidavit form. At the time of the hearing on applications involving such observations, the applicant should be prepared to present, as sworn testimony, complete data on the above.

3. DATA REQUIRED WITH APPLICATIONS INVOLVING DIRECTIONAL ANTENNA SYSTEMS

Section 3.33 (a) requires that an application for authority to install a directional antenna specify a definite site and that full details of the directional antenna are given with the application. Any application not complete in these details will be returned to the applicant as "defective" under Section 4.02.

In order to comply with the above and to permit proper consideration of any application involving a directional antenna, the following shall be submitted in triplicate, properly verified by the engineer designing the antenna, with each such application:

1. Name, address and qualifications of the engineer.

2. Complete description of the proposed antenna system.

a. Number of elements.

b. Type of each element [i. e., guyed or self-supporting, uniform cross-section or tapered (specify base width), ground or insulated, etc.].

c. If top loaded give details.

d. Height of vertical lead of each element in feet (height above base insulator or base if grounded).

e. Overall height in feet of each element above ground level.

f. Overall height in feet of each element above mean sea level.

g. Orientation of array with respect to true north and time phasing of fields from elements (specify degrees leading or lagging) and space phasing of elements (identifying elements). (Space phasing should be given in feet, as well as in degrees.)

h. Details of ground system for each element (length and number of radials, dimensions of ground screen, if used, and depth buried).

i. Ratio of fields from elements (identifying elements).

j. If not fully described above, give complete details and sketches if needed.

3. Caluclated horizontal field intensity patterns for each power involved showing:

a. Directional field intensity at one mile and effective field.

b. Direction true north shall be shown at zero azimuth.

c. Direction and distance to each existing station with which interference may be involved operating either directional or non-directional (all directions shall be determined by accurate calculation or from Lambert Conformal Conic

[22] See Annex III in Section "Engineering Standards of Allocation" for detailed requirements.

Projection Map such as U. S. Coast and Geodetic Survey Map No. 3060a, or map of equal accuracy, and all distances shall be determined by accurate calculation or from U. S. Albers Equal Area Projection May, scale $\frac{1}{2,500,000}$, or map of equal accuracy. These may be obtained from the U. S. Coast and Geodetic Survey and the United States Department of Interior, Geological Survey, for the sums of forty cents and one dollar, respectively).

d. Calculated field intensity contours for 250, 25, and 5 mv/m and the population residing within each of such contours in addition to the information required by Section 29 (d) of FCC Form 301, on a map having the largest practical scale.

4. Calculated vertical field intensity patterns (for nighttime power) in the directions of each minimum and the maximum and in the direction of each station with which nighttime interference may be involved, operating either directional or non-directional for angles from 0° to 90° above the ground plane, based on the ground wave field intensity at one mile from the antenna for the direction involved.

5. Data used in computing the above patterns including:

a. Formula used for calculating both horizontal and vertical patterns, and sample calculations. (Derivation of formula if other than standard is used.)

b. All assumptions made and basis therefor, including electrical height, current distribution and efficiency of each element and ground conductivities.

c. Complete tabulation of calculation data used in plotting patterns, including data for determination of r. m. s. value of horizontal and directional patterns.

6. Any other pertinent information.

7. Plotting of field intensity patterns:

a. All patterns shall be plotted on standard letter-size polar co-ordinate paper (main engraving approximately 7″×10″).

b. All patterns shall be plotted to the largest scale possible on the paper specified in Section (a) above using scale divisions and sub-divisions having values of 1, 2, 2.5 or 5 times 10^x. (No other values shall be used.)

c. All values of field intensity less than 10 percent of the effective field intensity of the pattern shall be shown on an enlarged scale in accordance with (a & b) above.

d. In the event actual inverse distance field intensities expected to be determined in practice (that is, the values determined from actual measurements particularly in sharp nulls) are different from the above calculated values, the expected values as well as the calculated values shall be shown on both the full patterns and the enlarged sections.

4. LOCATIONS OF TRANSMITTERS OF STANDARD BROADCAST STATIONS

Section 3.24 (e) requires that the location of the transmitter shall comply with the requirements of good engineering practice. There are set out below the general requirements considered appropriate at this time. These standards will change as the art progresses and changes will be made in accordance with the best information available.

All applications for approval of transmitter sites for regular broadcast stations must be submitted on FCC Form 301. In some cases the applicant may be required to submit additional information, including the results of a field intensity survey, particularly where there is any question as to whether the area can be served properly from the proposed location or where the population of the blanket area is too large.

FCC Form 301 requires that triplicate copies of the following be submitted:

(1) Map having scale not less than one inch to a mile clearly showing (by symbols, cross hatching, colored crayons or other means) present location, proposed location, character of surrounding area (retail or wholesale business, manufacturing, residential, or unpopulated), the heights of all tall buildings or other structures, if any, in the vicinity of the antenna indicating the distance and direction thereof from the proposed site and how marked for air navigation; also, density and distribution of population, the 250, 25 and 5 mv/m contours and the population residing within the 250 mv/m contour and the type of soil and terrain and the location of airports, airways, and other radio stations, including receiving stations, except broadcast or amateur.

(2) Aerial photograph or photographs (ordinary snapshots, if clear) taken from the proposed location of the antenna in at least eight directions (every 45°, North, Northeast, East, etc.) such as to clearly show the character of the immediate surrounding area.

Where available, United States Geological Survey Topography Quadrangle Sheets should be submitted. In the event the map submitted does not give the topography, the height above sea level of the proposed location, hills, ridges and other obstructions should be shown. A statement as to whether or not other obstructions in the vicinity are painted and lighted or otherwise marked should always be made. In some cases additional maps, sketches or descriptions may be necessary to clearly show the conditions. Attention is invited to the fact that the submission of complete and accurate information will materially expedite action on a proposed location as well as enable the Commission to reach a correct decision thereon.

Aerial photographs of adequate scale are normally considerably superior to photographs taken from the proposed site. However, if the latter clearly show the character of the surrounding area they are acceptable. Photographs taken from a location lower than the surrounding terrain or where the view is obstructed by immediately surrounding objects are of little value. Taking the photographs from a step ladder or other support will aid materially.

As a guide the Engineering Department has established certain engineering principles based on the extensive experience of the Engineering Department and all data available along this line, including that presented at the informal engineering hearings of October 5, 1936, January 18, 1937, and June 6, 1938.

The four primary objectives to be obtained in the selection of a site for a transmitter of a broadcast station are as follows:

1. To serve adequately the center of population in which the studio is located and to give maximum coverage to adjacent areas.
2. To cause and experience minimum interference to and from other stations.
3. To present a minimum hazard to air navigation consistent with objectives 1 and 2.
4. To fulfill certain other requirements given below.

The following table is offered as a general guide to be used in determining the approximate site of broadcast transmitters:

TABLE A

Power of station	Population of city or metropolitan area [1]	Approximate radius of blanket area 250 mv/m [3]	Site-distance from center of city (business or geographical)	Maximum percentage of total population in blanket area [1]
		Miles	*Miles*	*Per-cent*
100 watts	5,000–50,000	0.15	½–1	1
100 watts	50,000 or more	.15	(2)	------
250–500 watts	5,000–150,000	0.3– .5	1–3	1
250–500 watts	150,000 or more	.3– .5	(2)	------
1 kilowatt	5,000 to 200,000	.6– .9	2–5	1
1 kilowatt	200,000 or more	.6– .9	(2)	------
5–10 kilowatts	All	1.5–2.5	5–10	1
25–50 kilowatts	All	3.0–4.5	10–15	1

[1] The total population is the population of the city sought to be served except in those instances when the station is to be located in an area classified by the Department of Commerce, Bureau of Census, as a metropolitan area, in which case the population of the metropolitan area shall apply, provided, however, that when the power of the station is such that all the metropolitan area cannot be served, the population that will actually be served shall determine. The population figures are those determined by the latest official census and where greater population is claimed, the burden of proof is on the applicant.

[2] In these instances it is usually necessary to locate the station within the city in order to render satisfactory service throughout the city. Such sites shall be in or near the center of the business district and under no circumstances will a site in the residential area be approved.

[3] These radii are only approximate and the actual blanket area (area within the 250 mv/m contour) may be materially different depending on the antenna employed and other factors.

In case the power and the population of the city are such that it should be located at some distance from the center of the city, the approximate distance is given as well as the population of the so-called "blanket area." The "blanket area" of a broadcast station is defined as that area adjacent to the transmitter in which the usual broadcast receiver would be subject to some type of interference to the reception of other stations due to the strong signal from the station. The normal blanket area of a broadcast station is that area lying within the 250 millivolt per meter contour line. The average radii of the blanket areas for broadcast stations of the various powers are given in the above table.

In those cases where it is impossible or impractical to locate a station in accordance with the above specifications, the Commission will give consideration to approving locations where not more than one percent of the population (as above specified) is included within the 500 millivolt per meter contour, provided the applicant submits an affidavit setting forth the reasons why the normal specifications cannot be complied with, and further that the applicant will assume full responsibility for adjustment of any reasonable complaints arising from the excessively strong signals of the applicant's station. Particular attention must be given to avoiding cross modulation.

In this connection, attention is invited to the fact that it has been found very unsatisfactory to locate broadcast stations so that high signal intensities occur in areas with over-head electric power or telephone distribution systems and sections where the wiring and plumbing are old or improperly installed. These areas are usually found in the older or poorer sections of a city. These conditions give rise to cross modulation interference due to the non-linear conductivity characteristics of contacts between wiring, plumbing or other conductors. This type of interference is independent of the selectivity characteristics of the receiver and normally can be eliminated only by correction of the condition causing the interference. Cross modulation tends to increase with frequency and in some areas it has been found impossible to eliminate all sources of cross modulation, resulting in an unsatisfactory condition for both licensee and listeners.

Broadcast station transmitters will not be permitted to be located in these areas even though the population is within the requirements of Table A, unless the licensee assumes full responsibility for and it appears it can adjust all complaints satisfactorily.

If the city under consideration is of irregular shape, the station is of high power, a directional antenna system is employed, or if other unusual conditions obtain, the table may not apply and special consideration must be given. However, the general principles set out will still apply.

In selecting a site in the center of a city it is usually necessary to place the radiating system on the top of a building. This building should be large enough to permit the installation of a satisfactory ground and/or counterpoise system. Great care must be taken to avoid selecting a building surrounded by taller buildings or where any nearby building higher than the antenna is located in the direction which it is desired to serve. Such a building will tend to cast "radio shadows" which may materially reduce the coverage of the station in that direction. Irrespective of the height of surrounding buildings, the building on which the antenna is located should not have height of approximately one quarter wavelength. A study of antenna systems located on buildings tends to indicate that where the building is approximately a quarter wavelength in height, the efficiency of radiation may be materially reduced.

If from Table A it is determined that a site should be selected removed from the city, there are several general conditions to be followed in determining the exact site. The table gives the approximate distance from the center of the city. Three maps should be given consideration if available:

1. Map of the density of population and number of people by sections in the area.
2. Geographical contour map with contour intervals of 20 to 50 feet.
3. Map showing the type, nature and depth of the soil in the area with special reference to the condition of the moisture throughout the year. (See Table B.)

From these maps a site should be selected that is approximately the required distance from the city with a minimum population in the "blanket area" and with a minimum number of intervening hills between it and the center of the city. In general, because of ground conditions, it is better to select a site in a low area rather than on top of a hill, and the only condition under which a site on top of a hill should be selected is that it is only possible by this means to avoid a substantial number of hills, between the site and the center of a city with the resulting radio shadows. If a site is to be selected to serve a city which is on a general sloping area, it is generally better to select a site below the city than above the city.

If a compromise must be made between probable radio shadows from intervening hills and locating the transmitter on top of a hill, it is generally better to compromise in favor of the low area where an efficient radiating system may be installed which will more than compensate for losses due to shadows being caused by the hills if not too numerous or too high. Several transmitters have been located on top of hills, but so far as data has been supplied not a single installation has given superior efficiency of propagation and coverage.

The ideal location of a broadcast transmitter is in a low area of marshy or "crawfishy" soil or area which is damp the maximum percentage of time and from which a clear view over the entire center of population may be had, and the tall buildings in the business section of the city would cast a shadow across the minimum residential area.

The type and condition of the soil or earth immediately around a site is very important. Important, to an equal extent, is the soil or earth between the site and the principal area to be served. Sandy soil is considered the worst type with glacial deposits and mineral ore areas next. Alluvial, marshy areas and salt water bogs have been found to have the least absorption of the signal. One is fortunate to have available such an area and, if not available, the next best condition must be selected.

Table B indicates the values of inductivity and conductivity which it is recommended be used for various types of country in the absence of surveys over the particular area involved. Naturally, values obtained from the use of these figures will be only approximate and should, if possible, be replaced by actual measurements in the area under consideration.

TABLE B

Type of terrain	Inductivity	Conductivity	Absorption factor at 50 miles, 1000 kc.[1]
Sea water, minimum attenuation.	81	4.64×10^{-11}	1.0
Pastoral, low hills, rich soil, typical of Dallas, Texas, Lincoln, Nebraska and Wolf Point, Montana, areas.	20	3×10^{-13}	0.50
Pastoral, low hills, rich soil, typical of Ohio and Illinois.	14	10^{-13}	0.17
Flat country, marshy, densely wooded, typical of La. near Mississippi River.	12	7.5×10^{-14}	0.13
Pastoral, medium hills, and forestation, typical of Md., Pa., N. Y., exclusive of mountainous territory and sea coasts.	13	6×10^{-14}	0.09
Pastoral, medium hills and forestation, heavy clay soil, typical of central Va.	13	4×10^{-14}	0.05
Rocky soil, steep hills, typical of New England.	14	2×10^{-14}	0.025
Sandy, dry, flat, typical of coastal country.	10	2×10^{-11}	0.024
City, industrial areas, average attenuation.	5	10^{-14}	0.011
City, industrial areas, maximum attenuation.	3	10^{-15}	0.003

[1] This figure is stated for comparison purposes in order to indicate at a glance which values of conductivity and inductivity represent the higher absorption. This figure is the ratio between field intensity obtained with the soil constants given and with no absorption.

Careful consideration must be given to selecting a site so that the number of people in the blanket area is a minimum. The last column of Table A gives the per-

centage of the total population of the city or metropolitan area that may be permitted in the blanket area. In general, broadcast transmitters operating with approximately the same power can be grouped in the same approximate area and thereby reduce the interference between them.

If the city is of irregular shape, it is often possible to take advantage of this in selecting a suitable location that will give a maximum coverage and at the same time maintain a minimum of people within the blanket area. The maps giving the density of population will be a key to this. The map giving the elevation by contours will be a key to the obstructing hills between the site and city. The map of the soil conditions will assist in determining the efficiency of the radiating system that may be erected and the absorption of the signal encountered in the surrounding area.

Another factor to be considered is the relation of the site to airports and airways. There are no regulations or laws with respect to distance from airports and airways, but a distance of three miles from each is used as a guide. In case a suitable location is found at less distance than this, it may be satisfactory if the towers are suitably painted and lighted in conformity with the requirements of the Civil Aeronautics Authority, or if the towers are not higher than the surrounding objects. The latter is normally considered poor engineering practice, however, in selecting a site the local aeronautical authorities should always be consulted if there is any question concerning erecting a hazard to aviation, and in case of towers over 200 feet high this should always be done. In passing on a location and antenna installation, the Engineering Department refers each case to the Civil Aeronautics Authority for its recommendation. The action of the Authority will be materially expedited by the District Airline Inspector and local representatives of the airports and airlines forwarding their approval or comments to the Civil Aeronautics Authority, Washington, D. C.

In finally selecting the site, consideration must be given to the required space for erecting an efficient radiating system, including the ground or counterpoise (see Section 3.45). It is the general practice to use direct grounds consisting of a radial buried wire system. If the area is such that it is not possible to get such a ground system in soil that remains moist throughout the year, it probably will be found better to erect a counterpoise. (Such a site should be selected only as a last resort.) It, like the antenna itself, must of course be designed properly for the operating frequency and other local conditions.

While an experienced engineer can sometimes select a satisfactory site for a 100-watt station by inspection, it is necessary for a higher power station to make a field intensity survey to determine that the site selected will be entirely satisfactory. There are several facts that cannot be determined by inspection that make a survey very desirable for all locations removed from the city. Often two or more sites may be selected that appear to be of equal promise. It is only by means of field intensity surveys taken with a transmitter at the different sites or from measurements on the signal of nearby stations traversing the terrain involved that the most desirable site can be determined. There are many factors regarding site efficiency that cannot be determined by any other method.

The site selected should meet the following conditions:

1. A minimum field intensity of 25 to 50 millivolts per meter will be obtained over the business or factory areas of the city.

2. A minimum field intensity of 5 to 10 millivolts per meter will be obtained over the most distant residential section.

3. The absorption of the signal is the minimum for any obtainable sites in the area. As a guide in this respect the absorption of the signals from other stations in that area should be followed as well as the results of tests on other sites.

4. The population within the blanket radius (250 mv/m) does not exceed that specified by Table A.

When making the final selection of a site, the need for a field intensity survey to establish the exact conditions cannot be stressed too strongly. The selection of a proper site for a broadcast station is an important engineering problem and can only be done properly by experienced radio engineers.

5. MINIMUM ANTENNA HEIGHTS OR FIELD INTENSITY REQUIREMENTS

Section 3.45 requires that all applicants for new, additional or different broadcast facilities and all licensees requesting authority to move the transmitter of an existing station, shall specify a radiating system, the efficiency of which complies with the requirements of good engineering practice for the class and power of the station.

The specifications deemed necessary to meet the requirements of good engineering practice at the present state of the art are set out in detail below.

The licensee of a standard broadcast station requesting a change in power, time of operation, frequency or transmitter location must also request authority to install a new antenna system or to make changes in the existing antenna system which will meet the minimum height requirements, or submit evidence[24] that the present antenna system meets the minimum requirements with respect to field intensity, before favorable consideration will be given thereto. In the event it is proposed to make substantial changes in an existing antenna system, the changes shall be such as to meet the minimum height requirements or will be permitted subject to the submission of field intensity measurements showing that it meets the minimum requirements with respect to effective field intensity.

These minimum actual physical vertical heights of antennas permitted to be installed are shown by curves A, B, and C of Figure 7 as follows:

A. Class IV stations, 150 feet[25] or a minimum effective field intensity of 150 mv/m for 1 kilowatt. (100 watts 47.5 mv/m and 250 w, 75 mv/m).

B. Class II and III stations, or a minimum effective field intensity of 175 mv/m for 1 kilowatt.

C. Class I stations, or a minimum effective field intensity of 225 mv/m for one kilowatt.

The heights given on the graph for the antenna apply regardless of whether the antenna is located on the ground or on a building. Except for the reduction of shadows locating the antenna on a building does not necessarily increase the efficiency and where the height of the building is in the order of a quarter wave the efficiency may be materially reduced.

To obtain the maximum efficiency of which any antenna is capable a good ground system must be employed (a counterpoise may be substituted under certain conditions).

At the present development of the art, it is considered that where a vertical radiator is employed with its base on the ground, the ground system should consist of buried radial wires at least ¼ wavelength long. There should be as many of these radials evenly spaced as practicable and in no event less than 90. (120 radials of 0.35 to 0.4 of a wavelength in length and spaced 3° is considered an excellent ground system and in case of high base voltage, a base screen of suitable dimensions should be employed).

It should be borne in mind that the above specifications are the minimum and where possible better antenna and ground systems should be installed.

In case it is contended that the required antenna efficiency can be obtained with an antenna of height or ground system less than the minimum specified, a complete field intensity survey[26] must be supplied to the Commission showing that the field intensity at a mile without absorption fulfills the minimum requirements. This field survey must be made by a qualified engineer using equipment of acceptable accuracy.

The main element or elements of a directional antenna system shall meet the above minimum requirements with

[24] See "Field Intensity Measurements in Broadcast Allocation," Section A.

[25] This height applies to a Class IV station on a local channel only. In case a Class IV station is assigned a regional channel curve A shall apply.

[26] See "Field Intensity Measurements in Broadcast Allocation," Section A.

respect to height or effective field intensity. No directional antenna system will be approved which is so designed that the effective field of the array is less than the minimum prescribed for the class of station concerned or in case of a Class I station less than 90 percent of the ground wave field which would be obtained from a perfect antenna of the height specified by Fig. 7 for operation on frequencies below 1000 kilocycles and in the case of a Class II or III station less than 90 percent of the ground wave field which would be obtained from a perfect antenna of the height specified by Fig. 7 for operation on frequencies below 750 kc.

In all cases of new construction where concentric transmission line used between the transmitter and antenna is buried or cannot be readily opened throughout its entire length for immediate repair in case of failure, such line shall be installed in duplicate with adequate switching facilities for immediate connection of the second line in case of failure of the first line or permanently installed auxiliary facilities such as an auxiliary transmitter and antenna system, auxiliary antenna system or other means whereby operation may be continued in the event of failure of the transmission line.

Before any changes are made in the antenna system, it is necessary to submit full details to the Commission for approval. These data may be submitted by letter.

6. STANDARD LAMPS AND PAINTS

Section 3.45 (d) requires that the antenna and supporting structure shall be painted and illuminated in accordance with the specifications supplied by the Commission pursuant to Section 303 (q) of the Communications Act of 1934.

These individual specifications are issued for and attached to each authorization for an installation.[27] The details of the specifications depend on the degree of hazard presented by the particular installation. The following standard lamps and paints shall be used for the type of marking specified:

(a) Type A–21, 100-watt traffic signal, clear, medium screw base lamps enclosed in aviation red prismatic obstruction light globes shall be employed in all cases where 100-watt lamps are specified.

(b) Type PS–30, 200-watt general lighting service, clear, mogul prefocus base lamps shall be employed in all cases where code beacons with 200-watt lamps are specified.

(c) Type PS–40, 500-watt general lighting service, clear, mogul prefocus base lamps shall be employed in all cases where code beacons with 500-watt lamps are specified.

(d) Type T–24, 500-watt aviation lighting service, clear, mogul bi-post base lamps shall be employed in all cases where rotating beacons with 500-watt lamps are specified.

(e) Type T–20, 1000-watt aviation lighting service, clear, mogul bi-post base lamps shall be employed in all cases where rotating beacons with 1000-watt lamps are specified.

(f) The tower paint shall be kept in good condition and repainted as often as necessary to maintain this condition. Towers now painted black and yellow shall, when repainting is necessary be painted in accordance with the present standards.[27]

7. FURTHER REQUIREMENTS FOR POWER MEASUREMENTS OF POWER

Section 3.54 states that the antenna input power determined by direct measurement is the square of the antenna current times the antenna resistance at the point where the current is measured and at the operating frequency, and sets forth certain requirements relative to the determination of the resistance and measurement of the antenna current.

The Commission does not specify any particular method of making antenna resistance measurements. Measurements made by any standard method will be accepted provided satisfactory evidence is submitted in accordance with the following as to the procedure used, accuracy of the instruments and qualifications of the engineer conducting the measurements.

The resistance variation method, substitution method and bridge method are acceptable methods for measuring the total antenna resistance and the follow-

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[27] Specifications normally attached to authorization:

(a) *Painting.* Each tower shall be painted throughout its height with alternate horizontal bands of international orange and white, terminating with orange bands at both top and bottom. (Orange yellow No. 5 color card, supplement to U. S. Army Quartermaster Corps Specifications No. 3–1, color chip below.) The width of the orange bands shall be approximately one-seventh of the height of any structure less than 250 feet in height, and between 30 and 40 feet for structures over 250 feet in height. The width of the white bands shall be one-half that of the orange bands.

(b) *Lighting.* (1) Towers, the overall heights of which do not exceed 200 feet, shall be lighted as follows:

SPECIFICATION "A"

At the top of each tower there shall be installed two 100-watt lamps, enclosed in aviation red prismatic obstruction light globes. At least one of these lamps shall burn continuously from sunset to sunrise. When only one lamp is operated, the circuit shall be equipped with a relay for instant automatic switchover to the other lamp in case of lamp failure.

At both the one-third and two-thirds levels of each tower there shall be installed two 100-watt lamps enclosed in aviation red prismatic obstruction light globes, at each level, one each on diagonally opposite corners of the structure.

All 100-watt lamps shall be Type A–21 Clear Bulb Traffic Signal Lamps (2000 hours or equal).

All lamps shall be enclosed in aviation red prismatic obstruction light globes and all lighting shall be exhibited from sunset to sunrise.

* * * * *

Special conditions of terrain and location with respect to airports or airways may require additional lighting of the character hereinafter specified for towers the overall height of which exceeds 200 feet.

* * * * *

(2) Towers, the overall heights of which exceed 200 feet but do not exceed 300 feet, shall be lighted as follows:

SPECIFICATION "B"

At the top of each tower there shall be installed a hazard beacon similar and equal in effectiveness to the standard 300 m/m airways electric lantern. This beacon shall flash and shall be equipped with two 500-watt lamps (both lamps to burn simultaneously) and aviation red color shades. The 300 m/m electric code beacon shall be equipped with a flashing mechanism producing 40 flashes per minute, having a luminous period of one second, and a period of darkness of one-half second.

The one-third and two-thirds levels of the tower shall be marked by 100-watt obstruction lights the same as specified for towers not exceeding 200 feet in height.

* * * * *

Towers over 300 feet in height (and less than 300 feet in height where special conditions obtain) may be required to install additional marking as indicated below.

GENERAL

Under particularly hazardous conditions and in areas of heavy air traffic, it may be necessary to add a 24-inch 500 or 1000-watt red rotating beacon equipped with an automatic lamp changer, to mark the installation. The beacon may be installed on the roof of the transmitter building, provided the point will afford proper visibility, otherwise it may be necessary to install the beacon on a separate tower of proper height or on the radio tower itself. The recommended setting of this rotating beacon is such that the center line of the light beam shall be approximately 3 degrees above horizontal.

Adequate red warning lights shall be placed on the structure or structures during the period of construction and until the specified obstruction lights are installed and in operation.

Under certain conditions it may be required to have the lighting controlled by a light sensitive control device, the adjustment being such that lights will be turned on at a north sky light intensity level of 20-foot candles and turned off at a north sky light intensity level of 40-foot candles.

Under certain conditions it may be required to install and operate a radio obstruction marker of a type to be specified.

Specifications A and B require that at both the one-third and two-thirds levels of the structure there shall be installed two 100-watt lamps enclosed in aviation red prismatic obstruction light globes, at each level, one each on diagonally opposite corners of the structure.

Under certain conditions and in the case of triangular and other towers of unusual design, it may be required to install 100-watt lamps enclosed in aviation red prismatic obstruction light globes at various corners and levels throughout the height of the structure in such a manner so that adequate visibility and definition would be obtained from all angles of approach.

Towers of excessive height or peculiar (unusual) design will be made the subject of special investigation and analysis to determine proper marking and lighting.

In addition to the standard marking and lighting of the main structure, towers using guy wires will be made the subject of special study to determine proper marking and lighting of the guy wires.

The specifications relative to obstruction marking and lighting of radio towers of a certain height are general, and in locations of extreme hazard to air navigation, it may be required to install additional equipment on any height tower, in order to obtain suitable protection.

ing general instructions are given as a guide.

The apparatus required is as follows:

(a) Radio frequency generator to cover the frequency range necessary, power 50 watts or required power when using bridge method.

(b) Wavemeter for broadcasting frequency, accuracy 0.25%.

(c) Decade resistor having steps of units, tens and hundreds ohms resistance, or equivalent, accuracy 1.0%.

(d) Radio frequency galvanometer or milliammeter of approved type, accuracy 2.0%.

(e) Approved tuning condenser of approximately 0.001 MFD capacity and tuning inductance of approximately 60 MH.

(f) Or suitable bridge if this method is used.

The broadcast transmitter is not usually satisfactory for use as the source of radio frequencies. The maximum power dissipated in the antenna while making measurements should not be over 10% of the power available from the radio frequency generator.

An accurate determination of the antenna resistance can only be made by taking a series of measurements each for a different frequency. From 10 to 12 resistance measurements covering a band 50 to 60 kc wide with the operating frequency near the middle of the band must be made to give data from which accurate results may be obtained. The values measured should be plotted with frequency as abscissa and resistance in ohms as ordinate and a smooth curve drawn. The point on the ordinate where this curve intersects the operating frequency gives the value of the antenna resistance.

In order to comply with the provisions of Rule 33.06 the following data should be submitted in duplicate to the Commission in affidavit form, accompanied by duplicate copies of FCC Form 306 properly executed:

1. Complete data taken.
2. The graph drawn.
3. Description of method used to take readings (include schematic circuit diagrams of the measurement circuit and of the antenna system showing point of measurement and location in circuit of both regular and remote antenna ammeters).
4. Manufacturer's name of each calibrated instrument used and manufacturer's rated accuracy.
5. Accuracy, date and by whom each instrument was last calibrated.
6. Qualifications of engineer making measurements.

Licensees of broadcast stations authorized to employ directional antenna systems desiring to determine the operating power by direct measurement of the antenna power shall determine the resistance by the following method:

Measure the resistance at the point of common radio frequency input to the directional antenna system. The following conditions and procedure shall obtain:

(a) The antenna shall be finally adjusted for the required pattern.

(b) The reactance at the operating frequency and at the point of measurement shall be adjusted to zero or as near thereto as practical.

(c) Suitable radio frequency bridge or other method shall be employed to determine the resistance and reactance at the point of common radio frequency input in the same manner as set forth above for a single antenna.

(d) Resistance and reactance measurements at approximately 5, 10, 15 and 20 kc on each side of the operating frequency shall be made. The values measured shall be plotted and the resistance at the operating frequency determined in the same manner as for a single element antenna.

(e) A permanently installed antenna ammeter shall be placed in each element of the system as well as at the point of measurement of resistance with the remote reading ammeters [28] located in the transmitter room. The application for authority to determine power by the direct method shall specify not only the current at the point of resistance measurement for the authorized input power (I^2R in accordance with Section 3.54 and (f) below), but also the current of each element of the system when adjusted for the required pattern and for the authorized operating power.

(f) The license for a station of power of 5 kw or under, which employs a directional antenna and determines the power by the direct method, will specify the antenna resistance as 92.5% of that determined at the point of common input in accordance with the above. The resistance specified for stations of a power over 5 kw will be 95% of that determined at the point of common input.

[28] In all cases regular antenna ammeters and remote antenna ammeters shall comply with the requirements of Section 3.58 and "Indicating Instruments Pursuant to Section 3.58."

8. POWER RATING OF VACUUM TUBES

Section 3.42 requires that the maximum rated carrier power of a standard broadcast transmitter shall be determined as the sum of the applicable power ratings of the vacuum tubes employed in the last radio stage. The approved power ratings of vacuum tubes for operation in the last radio stages of broadcast transmitters are fixed as set out in the following tables:

TABLE A.[1]—*Power Rating of Vacuum Tubes for High-Level Modulation or Plate Modulation in the Last Radio Stage*

Power rating (watts)	Amperex	Collins	DeForest	Eitel McCullough	Federal Telegraph	Heintz & Kaufman	Hygrade Sylvania	RCA Mfg. Co.	Raytheon Production Corp.	United Electronics	Western Electric	Taylor Tubes, Inc.
50				35T		HK-54		808	RK-32		211D	T55
				50T					RK-35		211E	841A
									RK-37		248A	
									RK-47		276A	
									RK-51			
									RK-52			
75	HF-100	C-203A	503-A		F-303-A	154	203-A	203-A	RK-58	303-A	242A	203A
	203-A	C-211	511		F-311-A		211	211		311	242B	211
	211		552		F-352-A		852	838		361-A	242C	211C
	838		560				860	850		938	260A	
	852							852		952	261A	
	860							860			284A	
											295A	
100				100TH	F-102-A	254			RK-36			
				100TL	F-108-A				RK-38			
									RK-48			
125	HF-200	C-200		150-T	F-123-A			803	RK-57	905		T-155
	203-H	C-201						805	RK-28A			HD-203A
	211-C	C-211-D						810				
	211-D											
	211-H											
	805											
250	204-A	C-204-A	504-A		F-204-A	354	204-A	204A	RK-63	304-A	212-D	T200
	HF-300	C-300	561		F-212-E	HK354A	212-D	806		312-E	212-E	204A
	212-E		571		F-331-A	HK354C	831	831				814
						HK354D	861	861				822
						HK354E						
						HK354F						
350	270-A		549	250TH	F-100-A		849	849		949	270-A	
	849			250TL	F-849							
				300T								
500	251-A			450TL		255		833			251-A	
				450TH		654						
750	279-A	C-849-A	551	500T	F-121-A	2054-A	851	851		951	279A	
	849-A	C-849-H			F-351-A							
	849-H											
	851											

See footnotes at end of table.

TABLE A.[1]—*Power Rating of Vacuum Tubes for High-Level Modulation or Plate Modulation in the Last Radio Stage*—Continued

Power rating (watts)	Amperex	Collins	DeForest	Eitel McCullough	Federal Telegraph	Heintz & Kaufman	Hygrade Sylvania	RCA Mfg. Co.	Raytheon Production Corp.	United Electronics	Western Electric	Taylor Tubes, Inc.
1000	846			750TL	F-128-A	1554	846	846				
				750TH	F-346-A							
2500	228A		520-B		F-328-A	3054	820-B	520B			228A	
	1652		520-M		F-328-B			1652				
					F-348						343-A	
					F-3652-A							
	207		507		F-126-A		207	207			220B	
	220	C	548		F-307-A		848	848			220C	
	848		563		F-320-A		863	863			343A	
5,000	863				F-320-B			891				
	891				F-348-A			892				
	892				F-363-A			892R				
					F-892							
					F-892-R							
10,000	232-B				F-101-B			858			232A	
					F-110-A						232B	
					F-110-X						342A	
					F-116-A							
					F-332-A							
					F-332-B							
					F-332-C							
					F-358-A							
25,000					F-117-B							
					F-124-A							
40,000								862			298-A	
								898				
100,000											320-A	

[1] These tables apply only to tube ratings for use in the last radio stage of broadcast transmitters and may not be applicable to any other service.

If in an application to the Commission a vacuum tube of a type number and power rating not given in the foregoing tables is specified for operation in the last radio stage, it may be accepted provided there is also submitted to and approved by the Commission the manufacturer's rating of the vacuum tube for the system of modulation or class of service contemplated. These data shall be supplied by the manufacturer. (See section 3.42 and "Requirements for Approval of Power Rating of Vacuum Tubes.")

TABLE B[1]—*Power Rating of Vacuum Tubes for Low-Level Modulation or Last Radio Stage Operating as Linear Power Amplifier*

Power rating (watts)	Amperex	Collins	DeForest	Eitel McCullough	Federal Telegraph	Heintz & Kaufman	Hygrade Sylvania	RCA Mfg. Co.	Raytheon Production Cor.	United Electronics	Western Electric	Taylor Tubes, Inc.
25						154		203A	RK-32			203A
									RK-35			211
									RK-37			211C
									RK-47			841A
									RK-51			
50	HF-200			100TH	F-123-A	354		803	RK-36		242B	HD203-A
	203-H			100TL		[1] A		810	RK-38		242C	
	211-H			150-T		[1] C			RK-57			
	242-C					[1] D			RK-58			
						[1] E			RK-28A			
						[1] F			RK-48			

[1] HK354.

TABLE B.[1]—*Power Rating of Vacuum Tubes for Low-Level Modulation or Last Radio Stage Operating as Linear Power Amplifier*—Continued

Power rating (watts)	Amperex	Collins	DeForest	Eitel McCullough	Federal Telegraph	Heintz & Kaufman	Hygrade Sylvania	RCA Mfg. Co.	Raytheon Production Cor.	United Electronics	Western Electric	Taylor Tubes, Inc.
75	HF300		504-A		F-204-A		204-A	204A	RK-63	304-A	212D	T200
	212-E				F-212-E		212-D			312-E	212E	204A
	204-A											814
												822
125	270-A		549	250TH	F-100-A	654	849	849		949	270A	
	849			250TL	F-849			833				
				300T								
				450TL								
				450TH								
250	251-A	C-849-A	551	500-T	F-121-A	255	851	851		951	251A	
	849-A	C-849-H			F-128-A	1554						
	849-H				F-351-A							
	851											
350				750TL								
				750TH								
500	279-A				F-346-A	2054-A	846	846			279A	
	846					3054						
1,000	228-A		520-B		F-328-A		820-B	520B			228A	
	1652		520-M		F-328-B			1652				
					F-3652-A							
2,500	207		507		F-126-A		207	207			220-B	
	220-C		569		F-307-A		863	863			220-C	
	863				F-320-A			892			343-A	
	892				F-320-B						343-AA	
					F-363-A							
					F-892							
5,000					F-358-A			858				
8,500	232-B				F-101-B						232-A	
					F-110-A						232-B	
					F-110-X						342-A	
					F-116-A							
					F-332-A							
					F-332-B							
					F-332-C							
12,500					F-117-B							
					F-124-A							
25,000								862				
								898			298-A	
75,000											320-A	

TABLE C.[1]—*Power Rating of Vacuum Tubes for Grid Modulation in the Last Radio Stage (Operating Efficiency 25%)*

Power rating (watts)	Amperex	Collins	De-Forest	Eitel McCullough	Federal Telegraph	Heintz & Kaufman	Hygrade Sylvania	RCA Mfg. Co.	Raytheon Production Cor.	United Electronics	Western Electric	Taylor Tubes, Inc.
50	212-E 241-B 270-A			250TH 250TL	F-212-E	354 HK354 A&C			RK-63		212-E 270-A	
100				300T		654						
125				450TL 500T 750TL		255						
250						1554						
500						3054						

See footnotes, Table A, page 2877.

TABLE D.[1]—*Power Rating of Vacuum Tubes for Grid Modulation in the Last Radio Stage (Operating Efficiency 35%)*

Power rating (watts)	Amperex	Collins	De-Forest	Eitel McCullough	Federal Telegraph	Heintz & Kaufman	Hygrade Sylvania	RCA Mfg. Co.	Raytheon Production Corp.	United Electronics	Western Electric	Taylor Tubes, Inc.
250	849-A 849-H											
1000					F-328-A						228-A	
2500	892				F-307-A F-892							

See footnotes, Table A, page 2877.

9. REQUIREMENTS FOR APPROVAL OF POWER RATING OF VACUUM TUBES

Section 3.42 (c) requires that only vacuum tubes of approved rating be employed in the last radio stages of standard broadcast transmitters and that such approved ratings will be given only upon submission of the ratings by the manufacturer.

These ratings shall be supplied under oath in the following table form:

TABLE (A B C or D)—*Class of Operation*

[State whether for plate modulation in the last radio stage, low level modulation, or grid modulation in the last radio stage. See Section 3.52]

Type of tube	Epn	Epmn	Ipn	Ipmn	Rp	Ec	Power rating

The value of Epn and Ipn are those values that are recommended by the manufacturers for operation at the power rating specified. The values of Epmn and Ipmn are the maximum continuous operating values that the manufacturers will stand by their guarantee on the tube specified when used in the class of service above set out.

The power ratings given above are to apply when the following conditions and limitations as to operation prevail:

1. The vacuum tubes are to be used in the last radio stage of standard broadcast transmitters.

2. On the broadcast frequencies of 550 to 1600 kilocycles, inclusive.

3. The percentage of amplitude distortion or harmonic generation by the entire transmitter (from microphone terminals to antenna outputs) is not to be over 10 percent at 100 percent modulation. The radio harmonics are not to exceed the amount considered in accordance with good engineering practice. (See Section 3.46 and "Construction, General Operation and Safety of Life Requirements to comply with Section 3.46").

4. The ventilation, cooling, general condition of circuits with respect to tuning, impedance match and maintenance are to be that encountered in the average broadcast station and in accordance with good engineering practice. The operation, general maintenance and adjustments are to be those ordinarily encountered in a broadcast station.

5. The regulation of the power supply is to be that which has been found to exist throughout the United States where broadcast stations are located or may be located.

6. Table A should give the power rating for use in transmitter employing plate modulation in last radio stage under the above specified conditions. See Section 3.52, Table A.

7. Table B should give the rating for use in transmitter employing low level modulation under the above specified conditions. See Section 3.52, Table B.

8. Tables C and D should give the power rating for use in transmitter employing grid modulation in the last radio stage under the above specified conditions and plate efficiencies of 22 and 33 percent, respectively. (Request for approval of ratings for grid modulation in the last radio stage should specify whether the operating efficiency is to be 22 percent or 33 percent. No tube will be approved for both efficiencies. See Section 3.52, Table C.)

9. The operating power of the transmitter is to be determined by Sections 3.51, 3.52, 3.53 and 3.54.

10. Due consideration will be given to the general standard of rating so that tubes manufactured by different firms but having practically the same absolute characteristics will have approximately the same power rating.

11. The power rating should be an even power step as recognized by the Commission's plan of allocation (100 watts, 250 watts, 500 watts, 1,000 watts, 5 kw, 10 kw, 25 kw, 50 kw), or other ratings established in "Power Rating of Vacuum Tubes." If any other rating is desired, it will be necessary to support the request with satisfactory reasons therefor.

10. PLATE EFFICIENCY OF LAST RADIO STAGE

Section 3.53 requires that in computing the operating power of standard broadcast stations by the indirect method the efficiency factors specified in Section 3.52 shall apply in all cases and no distinction will be recognized due to the operating power being less than the maximum rated carrier power.[29]

In compliance with this rule standard broadcast stations permitted to determine the operating power by the indirect method in accordance with Section 3.51 (b) and to employ greater daytime power than nighttime power shall maintain the same operating efficiency for both daytime and nighttime operation.[30]

To determine whether this condition obtains, the following procedure should be used:

The apparent antenna resistance should be computed from the daytime (highest power) operating constants and then the nighttime power in the an-

[29] See Section 3.52, Table A.

[30] When different last radio stages with different systems of modulation are employed for the two powers, the same principle shall apply, that is, the power shall be determined by the plate input times the proper efficiency factor and the antenna current shall change in proportion to the square root of the change in power within 5 percent.

tenna determined from the I^2R using the apparent resistance previously determined. If this computed antenna power agrees with the nighttime operating power determined by the indirect method within plus or minus five percent, the station is considered as complying with the requirement of maintaining the same operating efficiency. In case the antenna current is subject to variation due to weather or other conditions, an attempt should be made to arrive at an average value for the purpose of the computations referred to herein.

11. OPERATING POWER TOLERANCE

Section 3.57 requires that except in case of emergency beyond the control of the licensee, the operating power of each standard broadcast station shall be maintained within the prescribed limits of the licensed power.

Each station shall be operated at all times as near to the authorized power as practicable. However, in order to provide for variations in the power supply or other factors affecting the operating power which would necessitate continual adjustment to keep the operating power exactly the same as the authorized power, the operating power may be permitted to vary from 5 percent above to 10 percent below the authorized power for periods of short duration.

In addition, to maintaining the operating power within the above limitations, broadcast stations employing directional antenna systems shall maintain the ratio of the antenna currents in the elements of the arrangement within 5 percent of that specified by the terms of the license or other instrument of authorization.

12. CONSTRUCTION, GENERAL OPERATION AND SAFETY OF LIFE REQUIREMENTS

Section 3.46 requires that the transmitter proper and associated transmitting equipment of each broadcast station shall be designed, constructed and operated in accordance with the standards of good engineering practice in addition to the specific requirements of the Rules and Regulations of the Commission.

The specifications deemed necessary to meet the requirements of the Rules and Regulations and good engineering practice with respect to design, construction and operation of standard broadcast stations are set forth below. These specifications will be changed from time to time as the state of the art and the need arises for modified or additional specifications.

A. *Design.* The general design of standard broadcast transmitting equipment [main studio microphone (including telephone lines if used as to performance only [31]) to antenna output] shall be in accordance with the following specifications. For the points not specifically covered below, the principles set out shall be followed:

The equipment shall be so designed that:

1. The maximum rated carrier power (determined by Section 3.42) is in accordance with the requirements of Section 3.41.

2. The equipment is capable of satisfactory operation at the authorized operating power or the proposed operating power with modulation of at least 85 to 95 percent with no more distortion than given in (3) below.

3. The total audio frequency distortion from microphone terminals, including microphone amplifier, to antenna output does not exceed 5 percent harmonics (voltage measurements of arithmetical sum or r. s. s.) when modulated from 0 to 84 percent, and not over 7.5 percent harmonics (voltage measurements of arithmetical sum or r. s. s.) when modulating 85 percent to 95 percent (distortion shall be measured with modulating frequencies of 50, 100, 400, 1000, 5000 and 7500 cycles up to tenth harmonic or 16000 cycles or any intermediate frequency that readings on these frequencies indicate is desirable).

4. The audio frequency transmitting characteristics of the equipment from the microphone terminals (including microphone amplifier unless microphone frequency correction is included in which event proper allowance shall be made accordingly) to the antenna output does not depart more than 2 decibels from that at 1000 cycles between 100 and 5000 cycles.

5. The carrier shift (current) at any percentage of modulation does not exceed 5 percent.

6. The carrier hum and extraneous noise (exclusive of microphone and studio noises) level (unweighted r. s. s.) is at least 50 decibels below 100 percent modulation for the frequency band of 150 to 5000 cycles and at least 40 decibels down outside this range.

7. The transmitter shall be equipped with suitable indicating instruments in accordance with the requirements of Section 3.58 and any other instruments necessary for the proper adjustment and operation of the equipment.

8. Adequate provision is made for varying the transmitter power output between sufficient limits to compensate for excessive variations in line voltage, or other factors which may affect the power output.

9. The transmitter is equipped with automatic frequency control equipment capable of maintaining the operating frequency within the limit specified by Section 3.59.

a. The maximum temperature variation [32] at the crystal from the normal operating temperature shall not be greater than:

1. Plus or minus 0.1 degree Centigrade when an X or Y cut crystal is employed, or

2. Plus or minus 1.0 degree Centigrade when low temperature coefficient crystal [33] is employed

b. Unless otherwise authorized, a thermometer shall be installed in such manner that the temperature at the crystal can be accurately measured within 0.05 degree Centigrade for X or Y cut crystal or 0.5 degree for low temperature coefficient crystal.

c. It is preferable that the tank circuit of the oscillator tube be installed in the temperature controlled chamber.

10. Means are provided for connection and continuous operation of approved modulation monitor and approved frequency monitor.

a. The radio frequency energy for operation of the approved frequency monitor shall be obtained from a radio frequency stage prior to the modulated stage unless the monitor is of such design as to permit satisfactory operation when otherwise connected and the monitor circuits shall be such that the carrier is not heterodyned thereby.

11. Adequate margin is provided in all component parts to avoid over-heating at the maximum rated power output.

B. *Construction.* In general, the transmitter shall be constructed either on racks and panels or in totally enclosed frames [34] protected as required by Article 810 of the National Electrical Code,[35] and as set forth below:

1. Means shall be provided for making all tuning adjustments, requiring voltages in excess of 350 volts to be applied to the circuit, from the front of the panels with all access doors closed.

2. Proper bleeder resistors or other automatic means shall be installed across all the condenser banks to remove any charge which may remain after the high voltage circuit is opened (in certain instances the plate circuit of the tubes may provide such protection, however,

[31] In cases where telephone lines are not available to give the performance as required in these specifications a relay transmitter may be authorized to supersede the lines.

[32] Explanations of excessive frequency deviations will not be accepted when temperature variations are in excess of the values specified below.

[33] See "Use of Low Temperature Coefficient Crystal."

[34] The final stages of high power transmitters may be assembled in open frames provided the equipment is enclosed by a protective fence.

[35] The pertinent sections of Article 810 of the National Electrical Code read as follows:

8191. *General.* Transmitters shall comply with the following:

a. *Enclosing.* The transmitter shall be enclosed in a metal frame or grille, or separated from the operating space by a barrier or other equivalent means, all metallic parts of which are effectually connected to ground.

b. *Grounding of controls.* All external metallic handles and controls accessible to the operating personnel shall be effectually grounded. No circuit in excess of 150 volts should have any parts exposed to direct contact. A complete dead-front type of switchboard is preferred.

c. *Interlocks on doors.* All access doors shall be provided with interlocks which will disconnect all voltages in excess of 350 volts when any access door is opened.

individual approval of such shall be obtained by the manufacturer in case of standard equipment and the licensee in case of composite equipment).

3. All plate supply and other high voltage equipment, including transformers, filters, rectifiers and motor generators, shall be protected so as to prevent injury to operating personnel.

a. Commutator guards shall be provided on all high voltage rotating machinery (coupling guards on motor generators, although desirable, are not required).

b. Power equipment and control panels of the transmitter shall meet the above requirements (exposed 220 volt AC switching equipment on the front of the power control panels is not recommended, however, is not prohibited).

c. Power equipment located at a broadcast station but not directly associated with the transmitter (not purchased as part of same), such as power distribution panels, control equipment on indoor or outdoor stations and the sub-stations associated therewith, are not under the jurisdiction of the Commission, therefore, Rule 32.06 does not apply.

d. It is not necessary to protect the equipment in the antenna tuning house and the base of the antenna with screens and interlocks, provided the doors to the tuning house and antenna base are fenced and locked at all times with the keys in the possession of the operator on duty at the transmitter. Ungrounded fencing or wires should be effectively grounded either directly or through proper static leaks. Lighting protection for the antenna system is not specifically required but should be installed.

e. The antenna, antenna lead-in, counterpoise (if used), etc., shall be installed so as not to present a hazard. The antenna may be located close by or at a distance from the transmitter building. A properly designed and terminated transmission line should be used between the transmitter and the antenna when located at a distance.[36]

4. Metering Equipment.[37]

a. All instruments having more than 1000 volts potential to ground on the movement shall be protected by a cage or cover in addition to the regular case—(Some instruments are designed by the manufacturer to operate safely with voltages in excess of 1000 volts on the movement. If it can be shown by the manufacturer's rating that the instrument will operate safely at the applied potential, additional protection is not necessary).

b. In case the plate voltmeter is located on the low potential side of the multiplier resistor with one terminal of the instrument at or less than 1000 volts above ground, no protective case is required. However, it is good practice to protect voltmeters subject to more than 5000 volts with suitable over-voltage protective devices across the instrument terminals in case the winding opens.

c. The antenna ammeters (both regular and remote and any other radio frequency instrument which it is necessary for the operator to read) shall be so installed as to be easily and accurately read without the operator having to risk contact with circuits carrying high potential radio frequency energy.

C. *Wiring and shielding.* 1. The transmitter panels or units shall be wired in accordance with standard switchboard practice, either with insulated leads properly cabled and supported or with rigid bus bar properly insulated and protected.

2. Wiring between units of the transmitter, with the exception of circuits carrying radio frequency energy, shall be installed in conduits or approved fiber or metal raceways to protect it from mechanical injury.

3. Circuits carrying low level radio frequency energy between units shall be either concentric tube, two wire balanced lines or properly shielded to prevent the pickup of modulated radio frequency energy from the output circuits.

4. Each stage (including the oscillator) preceding the modulated stage shall be properly shielded and filtered to prevent unintentional feedback from any circuit following the modulated stage (an exception to this requirement may be made in the case of high level modulated transmitters of approved manufacture which have been properly engineered to prevent reaction).

5. The crystal chamber, together with the conductor or conductors to the oscillator circuit, shall be totally shielded.

6. The monitors and the radio frequency lines to the transmitter shall be thoroughly shielded.

D. *Installation.* 1. The installation shall be made in suitable quarters.

2. Since an operator must be on duty during operation, suitable facilities for his welfare and comfort shall be provided.

E. *Spare tubes.* A spare tube of every type employed in the transmitter and frequency and modulation monitors shall be kept on hand. When more than one tube of any type are employed, the following table determines the number of spares of that type required:

Number of each type employed:	*Spares required*
1 or 2	1
3 to 5	2
6 to 8	3
9 or more	4

F. *Operation.* In addition to the specific requirements of the rules governing standard broadcast stations, the following operating requirements shall be observed:

1. The maximum percentage of modulation shall be maintained at as high level as practicable without causing undue audio frequency harmonics which shall not be in excess of 10 percent when operating with 85 percent modulation.

2. Spurious emissions, including radio frequency harmonics and audio frequency harmonics, shall be maintained at as low a level as practicable at all times in accordance with good engineering practice.

3. In the event interference is caused to other stations by modulating frequencies in excess of 7500 cycles or spurious emissions, including radio frequency harmonics and audio frequency harmonics outside the band plus or minus 7500 cycles of the authorized carrier frequency, the licensee shall install equipment or make adjustments which limit the emissions to within this band or to such an extent above 7500 cycles as to reduce the interference to where it is no longer objectionable.

4. The operating power shall be maintained within the limits of 5 percent above and 10 percent below the authorized operating power and shall be maintained as near as practicable to the authorized operating power.

5. Licensees of broadcast stations employing directional antenna systems shall maintain the ratio of the currents in the elements of the array within 5 percent of that specified by the terms of the license or other instrument of authorization.

6. In case of excessive shift in operating frequency during warm-up periods, the crystal oscillator shall be operated continuously. The automatic temperature control circuits should be operated continuously under all circumstances.

G. *Studio equipment.* The studio equipment shall be subject to all the above requirements where applicable except as follows:

1. If it is properly covered by an underwriter's certificate, it will be considered as satisfying the safety requirements.

2. Section 8191 of Article 810 of the National Electrical Code shall apply for voltages only when in excess of 500 volts.

No specific requirements are made relative to the design and acoustical treatment. However, the studios and particularly the main studio should be in accordance with the standard practice

[36] In all cases of new construction where a concentric transmission line used between the transmitter and antenna is buried or cannot be readily opened throughout its entire length for immediate repair in case of failure, such line shall be installed in duplicate with adequate switching facilities for immediate connection of the second line in case of failure of the first line or permanently installed auxiliary facilities such as an auxiliary transmitter and antenna system, auxiliary antenna system or other means whereby operation may be continued in the event of failure of the transmission line. It is also recommended that spare antenna and transmission line ammeters identical with those installed be kept on hand.

[37] In addition to the following requirements, instruments shall meet the requirements of Section 3.58 and "Indicating Instruments Pursuant to Section 3.58."

for the class of station concerned, keeping the noise level as low as reasonably possible.

13. INDICATING INSTRUMENTS PURSUANT TO SECTION 3.58

Section 3.58 requires that each standard broadcast station shall be equipped with suitable indicating instruments of accepted accuracy to measure the antenna current, direct plate circuit voltage, and the direct plate circuit current of the last radio stage.

The following requirements and specifications shall apply to indicating instruments used by standard broadcast stations in compliance with this rule:

A. Instruments indicating the plate current or plate voltage of the last radio stage, (linear scale instruments) shall meet the following specifications:

1. Length of scale shall be not less than 2 3/10 inches.

2. Accuracy shall be at least two percent of the full scale reading.

3. The maximum rating of the meter shall be such that it does not read off scale during modulation.

4. Scale shall have at least 40 divisions.

5. Full scale reading shall not be greater than five times the minimum normal indication.

B. Instruments indicating the antenna current shall meet the following specifications:

1. Instruments having logarithmic or square law scales.

(a) Shall meet same requirements as 1, 2 and 3 above for linear scale instruments.

(b) Full scale reading shall not be greater than three times the minimum normal indication.

(c) No scale division above one-third full scale reading (in amperes) shall be greater than 1/30 of the full scale reading. (Example: An ammeter meeting requirement (a) above having full scale reading of six amperes is acceptable for reading currents from two to six amperes provided no scale division between two and six amperes is greater than 1/30 of six amperes, 0.2 ampere.)

2. Radio frequency instruments having expanded scales.

(a) Shall meet same requirements as 1, 2 and 3 for linear scale instruments.

(b) Full scale reading shall not be greater than five times the minimum normal indication.

(c) No scale division above 1/5 full scale reading (in amperes) shall be greater than 1/50 of the full scale reading. (Example: An ammeter meeting the requirement (a) above is acceptable for indicating currents from one to five amperes provided no division between one and five amperes is greater than 1/50 of five amperes, 0.1 ampere.)

(d) Manufacturers of instruments of the expanded scale type must submit data to the Commission showing that these instruments have acceptable expanded scales, and the type number of these instruments must include suitable designation.

3. Remote reading antenna ammeters may be employed and the indications logged as the antenna current in accordance with the following:

(a) Remote reading antenna ammeters may be provided by:

1. Inserting second thermocouple directly in the antenna circuit with remote leads to the indicating instrument.

2. Inductive coupling to thermocouple or other device for providing direct current to indicating instrument.

3. Capacity coupling to thermocouple or other device for providing direct current to indicating instrument.

4. Current transformer connected to second thermocouple or other device for providing direct current to indicating instrument.

5. Using transmission line current meter at transmitter as remote reading ammeter. See paragraph (h) below.

6. Using indications of phase monitor for determining the ratio of antenna currents in the case of directional antennas provided the indicating instruments in the unit are connected directly in the current sampling circuits with no other shunt circuits of any nature.

(b) A thermocouple type ammeter meeting the above requirements shall be permanently installed in the antenna circuit. (This thermocouple ammeter may be so connected that it is short circuited or open circuited when not actually being read. If open circuited a make before break switch must be employed.)

(c) The remote ammeter shall be connected at the same point in the antenna circuit as the thermocouple ammeter or shall be so connected and calibrated as to read in amperes within two percent of this meter over the entire range above one-third or one-fifth full scale. See Sections B 1 (c) and B 2 (c) above respectively.

(d) The regular antenna ammeter shall be above the coupling to the remote meter in the antenna circuit so it does not read the current to ground through the remote meter.

(e) All remote meters shall meet the same requirements as the regular antenna ammeter with respect to scale accuracy etc.

(f) Calibration shall be checked against the regular meter at least once a week.

(g) All remote meters shall be provided with shielding or filters as necessary to prevent any feed-back from the antenna to the transmitter.

(h) In the case of shunt excited antennas, the transmission line current meter at the transmitter may be considered as the remote antenna ammeter provided the transmission line is terminated directly into the excitation circuit feed line which shall employ series tuning only (no shunt circuits of any type shall be employed) and insofar as practicable, the type and scale of the transmission line meter should be the same as those of the excitation circuit feed line meter (meter in slant wire feed line or equivalent).

(i) Remote reading antenna ammeters employing vacuum tube rectifier are acceptable provided:

1. The indicating instruments shall meet all the above requirements for linear scale instruments.

2. Data are submitted under oath showing the unit has an overall accuracy of at least 2 percent of the full scale reading.

3. The installation, calibration and checking are in accordance with the above requirements.

(j) In the event there is any question as to the method of providing or the accuracy of the remote meter, the burden of proof of satisfactory performance shall be upon the licensee and the manufacturer of the equipment.

C. Stations determining power by the indirect method may log the transmission line current in lieu of the antenna current provided the instrument meets the above requirements for antenna ammeters, and further provided that the ratio between the transmission line current and the antenna current is entered each time in the log. In case the station is authorized for the same operating power for both day and nighttime operation this ratio shall be checked at least once daily. Stations which are authorized to operate with nighttime power different from the daytime power shall check the ratio for each power at least once daily.

D. No instrument indicating the plate current or plate voltage of the last radio stage, the antenna current or the transmission line current when logged in lieu of the antenna current shall be changed or replaced without written authority of the Commission, except by instruments of the same make, type, maximum scale reading and accuracy. Requests for authority to change an instrument may be made by letter or telegram giving the manufacturer's name, type number, serial number and full scale reading of the proposed instrument and the values of current or voltage the instrument will be employed to indicate. Requests for temporary authority to operate without an instrument or with a substitute instrument may be made by letter or telegram stating the necessity therefor and the period involved.

E. No instrument, the seal of which has been broken, or the accuracy of which is questionable, shall be employed. Any instrument which was not originally sealed by the manufacturer that has been opened shall not be used until it has been recalibrated and sealed in accordance with the following: Repairs and recalibration of instruments shall be made by the manufacturer, by an authorized instrument repair service of the manufacturer or by some other properly

qualified and equipped instrument repair service. In either case the instrument must be resealed with the symbol or trade mark of the repair service and a certificate of calibration supplied therewith.

F. Since it is usually impractical to measure the actual antenna current of a shunt excited antenna system, the current measured at the input of the excitation circuit feed line is accepted as the antenna current.

G. Recording instruments may be employed in addition to the indicating instruments to record the antenna current and the direct plate current and direct plate voltage of the last radio stage provided that they do not affect the operation of the circuits or accuracy of the indicating instruments. If the records are to be used in any proceedings before the Commission as representation of operation with respect to plate or antenna current and plate voltage only, the accuracy must be the equivalent of the indicating instruments and the calibration shall be checked at such intervals as to insure the retention of the accuracy.

H. The function of each instrument shall be clearly and permanently shown on the instrument itself or on the panel immediately adjacent thereto.

14. REQUIREMENTS FOR TYPE APPROVAL OF BROADCAST TRANSMITTERS AND AUTOMATIC FREQUENCY CONTROL EQUIPMENTS

Sections 3.41 to 3.64 govern the design, construction, and technical operation of standard broadcast equipment. In order to facilitate filing of and action on applications for construction permits specifying equipment of standard manufacture, the Commission will approve, as complying with the technical requirements, such equipment by type subject to the following conditions and in accordance with the following procedure:

(a) Approval of equipment by the Commission is only to the effect that insofar as can be determined from the data supplied the equipment complies with the current requirements of good engineering practice and the technical Rules and Regulations of the Commission. The approval may be withdrawn upon subsequent inspection or operation showing the equipment is not as represented or does not comply with the technical Rules and Regulations of the Commission and the requirements of good engineering practice.

(b) Such approval shall not be construed to mean that the equipment will be satisfactory as the state of the art progresses and/or as the Rules and Regulations of the Commission may be changed as deemed advisable.

(c) Applicants specifying equipment of approved manufacture need not submit detailed descriptions and diagrams where the correct type number is specified provided the equipment, including the antenna tuning unit, is identical with that approved.

(d) In passing on equipment, no consideration is given by the Commission to patent rights.

(e) For approval of standard broadcast transmitters, manufacturers shall submit F. C. C. Form 301, completed with respect to all pertinent sections and the data set forth below, both of which shall be verified before a notary public.

1. Photograph or drawings or any other evidence that construction is in accordance with the requirements of good engineering practice.

2. Data and curves showing overall audio frequency response from 30 to 7500 cycles for approximately 25, 50, 85 and 100 (if obtainable) per cent modulation (reference frequency, 1000 cycles).

3. Data on audio frequency harmonics for 25, 50, 85 and 100 per cent modulation for the fundamental frequencies of 50, 100, 400, 1,000, 5,000 and 7,500 cycles (either arithmetical sum or root-sum-square values up to 10th harmonic or 16,000 cycles).

4. Percentage carrier shift (current) for 25, 50, 85 and 100 per cent modulation.

5. Carrier hum and extraneous noise generated within the equipment and measured as the level below 100 per cent modulation throughout audio spectrum or by bands.

6. Percentage of each measurable radio frequency harmonic generated under expected normal operating conditions or in the first installation.

7. How output power is varied to compensate for power supply voltage variations.

8. Data and curves on frequency stability for variations in ambient temperatures over the range encountered in practice.

9. Data and curves on frequency stability for variations in power supply voltage from 85 to 115 per cent normal values.

10. Net sale price.

(f) For approval of automatic frequency control equipment or automatic temperature control chambers, manufacturers shall complete F. C. C. Form 305 with respect to all pertinent sections and the data set forth below, both of which shall be verified before a notary public.

1. Photograph or drawings or any other evidence.

2. Data and curves on frequency stability for variations in ambient temperatures over maximum range encountered in practice.

3. Data and curves on frequency stability for variations in power supply voltage from 85 to 115 per cent normal values.

4. Net sale price.

15. REQUIREMENTS FOR APPROVAL OF FREQUENCY MONITORS

Section 3.60 requires that the licensee of each standard broadcast station have in operation at the transmitter a frequency monitor independent of the frequency control of the transmitter. The frequency monitor shall be approved by the Commission and shall have a stability and accuracy at least five parts per million.

A. General Requirements and Approval

There are several ways or means by which it can be determined whether the frequency of the omitted carrier wave is within the required limits of the assigned frequency. However, one of the commonest ways is by means of a local piezo oscillator of known frequency producing a beat with the omitted wave used in conjunction with an instrument to indicate the resultant beat frequency. The visual indicator [38] is the only method now in common use by which it is considered that the frequency of the beat may be determined with the required degree of accuracy. Approval of a frequency monitor will be given based upon data taken at the Bureau of Standards. However, the Bureau of Standards does not approve or disapprove the monitor as this is entirely in the hands of the Commission. Any manufacturer desiring to submit a monitor for approval shall supply the Commission with full details. If the specifications appear to meet the requirements, the Commission will request the Bureau of Standards to issue shipping instructions. The cost of tests as well as the shipping charges shall be paid by the manufacturer.

In approving a frequency monitor, based upon the tests at the Bureau of Standards, the Commission merely recognizes that the type of monitor has the inherent capability of functioning in compliance with Section 3.60, if properly constructed, maintained, and operated. The Commission accepts no responsibility beyond this and further realizes that these monitors may have a limited range over which the visual indicator will determine deviations. Accordingly, it is necessary that adjunct equipment be used to determine major deviations.[38]

No change whatsoever will be permitted in the monitors sold under approval number issued by the Commission except when the licensee or the manufacturer is specifically authorized to make such changes.

When it is desired to make any change, either mechanical or electrical, the details shall be submitted to the Commission for its consideration.

Approval is given subject to withdrawal if the unit proves defective in service and can not be relied upon under usual conditions of maintenance and operation encountered in the average standard broadcast station. Withdrawal

[38] In addition to the visual indicator the range of which is necessarily limited in order to obtain the required accuracy, an aural indicator should also be employed to indicate frequency deviations beyond the range of the visual indicator particularly where the visual indicator is so designed that the indication becomes zero when the deviations become considerably greater than the range of the instrument. When it is desired to make any change, either mechanical or electrical, the details shall be submitted to the Commission for its consideration.

of approval means that no further units may be installed by standard broadcast stations for the purpose of complying with Section 3.60, but will not affect units already sold, unless it is found that there has been an unauthorized change in design or construction, or the material or workmanship is defective. All manufacturers of approved frequency monitors shall keep a list of sale numbers of the monitors sold to licensees of standard broadcast stations under the assigned approval number, and shall advise the Commission upon shipment of the monitor to the standard broadcast station.

B. General Specifications

The general specifications that frequency monitors shall meet before they will be approved by the Commission are as follows:

1. The unit shall have an accuracy of at least five parts per million under ordinary conditions (temperature, humidity, power supply, and other conditions which may affect its accuracy) encountered in standard broadcast stations throughout the United States.

2. The range of the indicating device shall be at least from fifty cycles below to fifty cycles above the assigned frequency.

3. The scale of the indicating device shall be so calibrated as to be accurately read within at least one cycle.

4. The unit shall be equipped with an automatic temperature control chamber (preferably enclosing the tank circuits of the oscillator) such that the maximum temperature variation at the crystal from the normal operating temperature shall not be greater than,

(a) Plus or minus 0.05° Centigrade when *X* or *Y* cut crystal is employed, or

(b) Plus or minus 0.5° Centigrade when low temperature coefficient crystal is employed.

5. Unless otherwise specifically authorized the instrument shall be equipped with a thermometer such that the temperature can be accurately measured within 0.025° Centigrade for *X* or *Y* cut crystal or 0.25° Centigrade for low temperature coefficient crystal.

6. The monitor circuit shall be such that it may be continuously operated and the omitted carrier of the station is not heterodyned thereby.

7. Means shall be provided for adjustment of the temperature or other means for correction of the indications of the monitor to agree with the external standard.

C. *Tests to be made by the Bureau of Standards*

The tests to be made at the Bureau of Standards will include the determination of the following:

1. *Accuracy.* (a) Oscillator frequency, as received.

(b) Constancy of oscillator frequency, as measured several times in one month.

(c) Accuracy of readings of frequency-difference instrument.

(d) Functioning of frequency adjustment device.

(e) Effects on frequency of changing tubes and of voltage variations.

2. *Temperature control stability.* (a) Effect on frequency of variation of room temperature through a range not to exceed 10° to 35° C.

3. *Sensitivity.* (a) Response of indicating instrument to small changes of frequency.

4. *General construction.* (a) Inspection to determine ability to stand shipment and service.

(b) Special tests to determine quality of construction, such as effect of tilting or tipping on frequency.

5. *Miscellaneous performance.* (a) Various, depending on character of apparatus (e. g., changes after stopping and starting, effect of varying coupling with transmitter, etc.)

The equipment will be operated in a test in the same way and the same conditions under which it will be used in service as specified by the manufacturer. The manufacturer shall supply to the Bureau of Standards all instructions or services which will be supplied to the purchaser of the equipment. The equipment, as submitted, shall be adjusted for operation in connection with broadcast stations operating on 1600 kilocycles.

16. REQUIREMENTS FOR APPROVAL OF MODULATION MONITORS

Section 3.55 (b) requires all broadcast stations to have in operation a modulation monitor approved by the Commission and Section 3.55 (d) states that the Commission will from time to time publish the specifications, requirements and list of approved modulation monitors. The specifications and requirements for approval are set out below. For a list of approved modulation monitors, attention is invited to Commission release "List of Approved Modulation Monitors."

Approval will be given based on the test data taken at the Bureau of Standards. However, the Bureau of Standards does not approve or disapprove the monitor as this is entirely in the hands of the Commission. Any manufacturer desiring to submit a monitor for approval shall supply the Commission with full details and if the specifications appear to meet the requirements, the Commission will request the Bureau of Standards to issue shipping instructions. The cost of tests, as well as the shipping charge, shall be paid by the manufacturer.

The specifications that the modulation monitor shall meet before it will be approved by the Commission are as follows:

1. A DC meter for setting the average rectified carrier at a specific value and to indicate changes in carrier intensity during modulation.

2. A peak indicating light or similar device that can be set at any predetermined value from 50 to 120 percent modulation to indicate on positive peaks, and/or from 50 to 100 percent negative modulation.

3. A semi-peak indicator with a meter having the characteristics given below shall be used with a circuit such that peaks of modulation of duration between 40 and 90 milliseconds are indicated to 90 percent of full value and the discharge rate adjusted so that the pointer returns from full reading to 10 percent of zero within 500 to 800 milliseconds. A switch shall be provided so that this meter will read either positive or negative modulation and, if desired, in the center position it may read both in a full-wave circuit.

The characteristics of the indicating meter are as follows:

Speed—The time for one complete oscillation of the pointer shall be 290 to 350 milliseconds. The damping factor shall be between 16 and 200. The useful scale length shall be at least 2.3 inches. The meter shall be calibrated for modulation from 0 to 110 percent and in decibels below 100 percent with 100 percent being 0 DB.

The accuracy of the reading on percentage of modulation shall be ±2 percent for 100 percent modulation, and ±4 percent of full scale reading at any other percentage of modulation.

4. The frequency characteristics curve shall not depart from a straight line more than ±½ DB from 30 to 10,000 cycles. The amplitude distortion or generation of audio harmonics shall be kept to a minimum.

5. The modulation meter shall be equipped with appropriate terminals so that an external peak counter can be readily connected.

6. Modulation will be tested at 115 volts ±5 percent and 60 cycles, and the above accuracies shall be applicable under these conditions.

7. All specifications not already covered above, and the general design, construction, and operation of these units must be in accordance with good engineering practice.

17. USE OF LOW TEMPERATURE COEFFICIENT CRYSTALS BY BROADCAST STATIONS

Section 3.62 requires that authority from the Commission shall be obtained before installing new automatic frequency control equipment or making changes in existing automatic frequency control equipment that may affect the precision of the frequency control. Therefore, licensees of standard broadcast stations desiring to install crystals of the low temperature coefficient type must obtain authorization therefor from the Commission. Requests for such authority may be made by letter specifying the manufacturer's name (see list of

manufacturers of approved crystals below) and the guaranteed temperature coefficient and accuracy of calibration.

Use of a properly ground low temperature coefficient crystal normally materially increases the frequency stability, particularly where the equipment is subject to wide variations in ambient temperature. Where a crystal of this type is installed in the automatic frequency control unit but not in the approved frequency monitor, the stability of the control unit becomes considerably better than that of the monitor and unless care is exercised in making frequency adjustments, off frequency operation may occur. Therefore, it is recommended that when the crystal in the frequency control unit is changed to one of the low temperature coefficient type, a crystal of equal or better temperature coefficient and accuracy be installed in the monitor, authority for which may be requested by letter in the same manner as for installation in the automatic frequency control unit.

Manufacturers desiring approval of crystals of the low temperature coefficient type must submit under oath data on several such typical crystals manufactured by them showing that the temperature coefficient is not in excess of three parts per million per degree Centigrade, and further affirming that no crystal of this type having a temperature coefficient in excess of this value will be supplied to any broadcast station and that all crystals so supplied will be ground to within five parts per million of the assigned frequency of the station for the normal operating temperature specified.

Manufacturers of Low Temperature Coefficient Crystals Which Have Been Accepted by the Commission

Bellefonte Eng. Labs., Bellefonte, Pa.

Premier Crystal Labs. Inc., 53–63 Park Row, New York City.

RCA Mfg. Co., Camden, New Jersey.

Precision Piezo Service, Baton Rouge, La.

Scientific Research Laboratories, Hyattsville, Md.

Commercial Radio Equipment Co., 216 E. 74th Street, Kansas City, Missouri.

Hollister Crystal Co., Merriam, Kansas.

Piezo Electric Laboratories, New Dorp, New York.

Collins Radio Co., Cedar Rapids, Ia.

Western Electric Co., New York, N. Y.

William W. L. Burnett, San Diego, Calif.

American Piezo Supply Co., Kansas City, Mo.

Bliley Electric Co., Union Station Bldg., Erie, Pennsylvania.

Hipower Crystal Co., 2035 W. Charleston Street, Chicago, Illinois.

Precision Crystal Laboratories, P. O. Box 326, Springfield, Massachusetts.

18. MONEY REQUIRED TO CONSTRUCT AND COMPLETE ELECTRICAL TESTS OF STATIONS OF DIFFERENT CLASSES AND POWERS

Section 3.24 (c) requires that an applicant for a standard broadcast station show that it is financially qualified to construct and operate the proposed station.

It is considered that the money specified below is required to construct and complete electrical tests of a new standard broadcast station of the class and power indicated, in accordance with the requirements of the Rules and Regulations of the Commission and good engineering practice.

Power and class of station:	*Money required*
100 Watts, Class IV	$6,500
250 Watts, Class IV	8,500
250 Watts, Class II	10,000
500 Watts, Class II or III	22,500
1,000 Watts, Class II or III	25,000
5 kw, Class II or III	40,000
10 kw, Class I or II	65,000
25 kw, Class I or II	175,000
50 kw, Class I or II	200,000

Attention is invited to the fact that the above figures are considered the minimum required for satisfactory installation, including the transmitter, antenna system, monitoring equipment and equipment for one large and one small studio of average dimensions and equipment including microphones, speech input equipment, and usual acoustical treatment, but exclusive of the cost of land and buildings and organization and development costs in more elaborate installations including directional antenna would increase the cost accordingly.

19. USE OF COMMON ANTENNA BY STANDARD BROADCAST STATIONS OR ANOTHER RADIO STATION

Section 3.45 (e) permits the simultaneous use of the same antenna or antenna structure by two standard broadcast stations or a standard broadcast station and a station of another service or class only when both are licensed to the same licensee.

Such simultaneous use may be authorized to the same licensee provided:

1. Complete verified engineering data are submitted showing that satisfactory operation of each station will be obtained without adversely affecting the operation of the other station.

2. The requirements of Section 3.45 (a) and (b) are met with respect to the minimum antenna height or field intensity for each standard broadcast station concerned.

20. USE OF FREQUENCY AND MODULATION MONITORS AT AUXILIARY BROADCAST TRANSMITTERS

Sections 3.60 and 3.55 (b) require that each standard broadcast station have approved frequency and modulation monitors in operation at the transmitter.

The following shall govern the installation of approved *frequency* and *modulation* monitors at auxiliary transmitters of standard broadcast stations in compliance with these rules:

In case the auxiliary transmitter location is at a site different from that of the main transmitter, an approved *frequency* monitor shall be installed at the auxiliary transmitter except when the frequency of the auxiliary transmitter can be monitored by means of the frequency monitor at the main transmitter.

The licensee will be held strictly responsible for any frequency deviation of the auxiliary transmitter in excess of fifty cycles from the assigned frequency, even though exempted by the above from installing an approved frequency monitor. Furthermore, whenever the auxiliary transmitter is operated without a frequency monitor under this exemption, it shall be monitored by means of the frequency monitor at the main transmitter.

Installation of an approved *modulation* monitor at the location of the auxiliary transmitter, when different from that of the main transmitter, is optional with the licensee. However, when it is necessary to operate the auxiliary transmitter beyond two calendar days, a modulation monitor shall be installed and operated at the auxiliary transmitter. The monitor (if taken from the main transmitter) shall be reinstalled at the main transmitter immediately upon resumption of operation of the *main transmitter*.

In all cases where the auxiliary transmitter and the main transmitter have the same location, the same frequency and modulation monitors may be used for monitoring both transmitters, provided they are so arranged as to be readily switched from one transmitter to the other.

Standard broadcast stations not complying with these requirements cannot be considered as operating in compliance with the rules governing such operation.

21. APPROVED FREQUENCY MONITORS

Section 3.60 requires that each standard broadcast station shall have in operation at the transmitter an approved frequency monitor [39] independent of the frequency control of the transmitter.

The following frequency monitors have been approved as in compliance with the specifications issued pursuant to Section 3.60:

[39] These monitors have a limited range over which the visual indicator will operate and accordingly it is necessary that auxiliary aural means be provided in conjunction with the monitor to indicate deviations, if considerably in excess of 50 cycles, such as may occur because of defective transmitting apparatus or other causes. In approving the monitors the Commission expects that this auxiliary equipment will be used by all broadcast licensees and will not accept as satisfactory explanations of any frequency deviation which may occur simply on the basis that it was not indicated by the monitor.

Manufacturer's name	Type	Approval No.
DeForest Radio Company.	A B M - 106, Model A.	1451
General Radio Company	Oscillator, Type 475-A or B.	1452
	Deviation Meter, Type 681.	
	Quartz Plate, Type 376-J or L.	
Western Electric Company.	1-A	1453
	Oscillator, 700-A modified.	
RCA Victor Company	EX-4180	1454
Doolittle and Falknor, Inc.	FD-1	1455
Bremer Broadcasting Corp.	A	1456
H. O. Boehme, Inc	5-M	1456
International Broadcasting Equipment Company.	Type 60	1457
Piezo Electric Laboratories.	PM-425-A	1458
Pillar of Fire	A	1459
Hygrade Sylvania Corporation.	Model 30 J	1460

22. APPROVED MODULATION MONITORS AND LOGGING OF INDICATIONS

Section 3.55 (b) requires that each standard broadcast station shall have an approved modulation monitor in operation at the transmitter.

The following modulation monitors have been approved as in compliance with the specifications issued pursuant to Section 3.55 (d):

Manufacturer's name	Type No.	Approval No.
General Radio Company	731-A	1551
RCA Manufacturing Company	66-A	1552
RCA Manufacturing Company	66-B	1553

23. APPROVED EQUIPMENT

Sections 3.41 to 3.64 govern the design, construction, and technical operation of standard broadcast equipment. There is listed below the equipments which have been approved as in compliance with these rules in accordance with the provisions of "Requirements for Type Approval of Broadcast Transmitters and Automatic Frequency Control Equipment."

American Piezo Supply Company, 40th & Woodland Ave., Kansas City, Mo.:

Type No. C-X-1, Automatic Frequency Control Unit.

Type No. C-X-1-P, Automatic Frequency Control Unit with Power Supply.

Type No. C-X-7-C, Automatic Frequency Control Unit.

American Sales Company, 44 W. 18th St., New York City:

Catalogue No. 601, 50 watt Broadcast Transmitter (includes REL Cat. No. 285 AFCU).

Bliley Electric Company, 203 Union Station Building, Erie, Pa.:

Type No. BC 46, Automatic Temperature Control Unit.

Collins Radio Company, Cedar Rapids, Iowa:

Type No. 10L, Automatic Frequency Control Unit.

Type No. 10S, Automatic Frequency Control Unit.

Type No. 10S-1, Automatic Frequency Control Unit.

Type No. 20A, 500-watt Broadcast Transmitter.

Type No. 20C, 1,000-watt Broadcast Transmitter.

Type No. 20C-1, 1,000-watt Broadcast Transmitter.

Type No. 20C-2, 1,000-watt Broadcast Transmitter.

Type No. 20D, 1,000-watt Broadcast Transmitter.

Type No. 20E, 1,000-watt Broadcast Transmitter.

Type No. 20H, 1,000-watt Broadcast Transmitter.

Type No. 20J, 1,000-watt Broadcast Transmitter.

Type No. 21C, 5,000-watt Broadcast Transmitter.

Type No. 21D, 5,000-watt Broadcast Transmitter.

Type No. 40A, Automatic Frequency Control Unit.

Type No. 40A-1, Automatic Frequency Control Unit.

Type No. 40C, Automatic Frequency Control Unit.

Type No. 40D, Automatic Frequency Control Unit.

Type No. 300B-100w, 100-watt Broadcast Transmitter.

Type No. 300B-250w, 250-watt Broadcast Transmitter.

Type No. 300C, 250-watt Broadcast Transmitter.

Type No. 300C-1, 250-watt Broadcast Transmitter.

Type No. 300D, 100-watt Broadcast Transmitter.

Type No. 300D-1, 100-watt Broadcast Transmitter.

Type No. 300D-2, 100-watt Broadcast Transmitter.

Type No. 300D-3, 100-watt Broadcast Transmitter.

Type No. 300E, 100-watt Broadcast Transmitter.

Type No. 300F, 250-watt Broadcast Transmitter.

Commercial Radio Equipment Company, 7205 Baltimore St., Kansas City, Mo.:

Type No. FC-2, Automatic Frequency Control Unit.

DeForest Radio Company (Now owned by RCA Victor Co., Inc., Camden, N. J.):

Type No. ABM 104, automatic Frequency Control Unit Model B.

Type No. 107-A, 50-watt Broadcast Transmitter Model TBM 104.

Type No. 107-B, 100-watt Broadcast Transmitter Model TBM 105.

Type No. 109-C, 250-watt Broadcast Transmitter.

Type No. 104-A, 500-watt Broadcast Transmitter.

Type No. 116-A, 1,000-watt Broadcast Transmitter.

Type No. 105-B, 5,000-watt Broadcast Transmitter.

Doolittle and Falknor Inc., 1306 W. 74th St., Chicago, Ill.:

Type No. OB-1, Automatic Frequency Control Oscillator and Amplifier Unit (includes Type 1-B ATCC).

Type No. OB-2, Automatic Frequency Control Unit (includes Type 1-B ATCC).

Type No. OB-5, Automatic Frequency Control Unit (includes Type TC-1 ATCU).

Type No. TC-1, Automatic Temperature Control Unit (includes Type 2-A ATCC).

Type No. 100-B, 100-watt Broadcast Transmitter (includes Type OB-2 or OB-5 AFCU).

Type No. 250-B, 250-watt Broadcast Transmitter (includes Type OB-2 or OB-5 AFCU).

Gates American Corp., Quincy, Illinois:

Type No. 25-A, Automatic Frequency Control Unit.

Type No. 100-A, 100-watt Broadcast Transmitter.

Type No. 250-A, 250-watt Broadcast Transmitter.

Hygrade Sylvania Corp., Electronics Dept., Clifton, N. J.:

Type No. 120-A, 100-watt Broadcast Transmitter (only one built for WNRA).

Type No. 121-A, 100-watt Broadcast Transmitter.

Type No. 162-A, 250-watt Broadcast Transmitter.

Type No. 190-A, 500-watt Broadcast Transmitter.

Type No. 210-A, 750-watt Broadcast Transmitter (Rated 500 watt for Broadcast Service).

Type No. 241-A, 1-kw Broadcast Transmitter.

Type No. 260-A, 5-kw Broadcast Transmitter.

Type No. 270-A, 10-kw Broadcast Transmitter.

International Broadcasting Equipment Co., 312 W. 51st Street, Chicago, Illinois:

Type No. 6-B, Automatic Frequency Control Unit (for use WE equipment).

Type No. 52-A, Automatic Frequency Control Unit.

Type No. 52-B, Automatic Frequency Control Unit.

Type No. 100-250-38, 250-watt Broadcast Transmitter.

Kluge Radio Company, 1041 North Bonnie Brae, Los Angeles, Calif. (formerly National Broadcasting Equipment Co., Scottsbluff, Nebr.):

Type No. 4-B, 100-watt Broadcast Transmitter.

Type No. 4-C, 250-watt Broadcast Transmitter.

Type No. 4–D, 100-watt Broadcast Transmitter.

Piezoelectric Laboratories, 612 Rockland Ave., New Dorp, N. Y.:

Type No. TC–210, Automatic Temperature Control Oven and Relay Unit.
Type No. TC–350, Automatic Temperature Control Oven and Relay Unit.
Type No. OB–10, Oscillator and Amplifier Unit (Oscillator and first buffer, no ATCU or crystal).
Type No. OB–20, Amplifier Unit (second buffer).

Precision Piezo Service, 427 Asia St., Baton Rouge, La.:

Type No. 50–M, Automatic Temperature Control Unit.

Premier Crystal Laboratories, Inc., 53–63 Park Row, New York, N. Y.:

Type No. 350–A, Automatic Frequency Control Unit.

RCA Victor Inc., Camden, New Jersey:

Type No. EX–4170, Automatic Frequency Control Unit.
Type No. UL–4252–A, Automatic Frequency Control Unit.
Type No. UL–4252–X, Automatic Frequency Control Unit.
Type No. UL–4292, Automatic Frequency Control Unit.
Type No. OA–1A, Automatic Frequency Control Unit.
Type No. OA–1B, Automatic Frequency Control Unit.
Type No. 100–E, 100-watt Broadcast Transmitter.
Type No. 100–G, 100-watt Broadcast Transmitter.
Type No. 100–H, 100-watt Broadcast Transmitter.
Type No. 100–W, 100-watt Broadcast Transmitter.
Type No. 250–D, 250-watt Broadcast Transmitter.
Type No. 250–E, 250-watt Broadcast Transmitter.
Type No. 250–F, 250-watt Broadcast Exciter Unit.
Type No. 250–G, 250-watt Broadcast Transmitter.
Type No. 250–W, 100/250-watt Broadcast Transmitter.
Type No. ET–4230, 100-watt Broadcast Transmitter.
Type No. ET–4240, 100-watt Broadcast Transmitter.
Type No. ET–4240–A, 100-watt Broadcast Transmitter.
Type No. ET–4250, 250-watt Broadcast Transmitter.
Type No. ET–4250–A, 250-watt Broadcast Transmitter.
Type No. 1001–C, 500/1,000-watt Broadcast Transmitter (NG 250 watts).
Type No. 1001–D (1–D), 500- and 1,000-watt Broadcast Transmitter.
Type No. ET–4251AA, 1-kw. Amplifier Unit.
Type No. AA–4251, 1-kw. Power Amplifier and Modulator Unit (added to Type ET–4250 makes Type 1001–D.)
Type No. 1–D–A, 500-watt Broadcast Transmitter (modified for 500 watts).
Type No. 1–D–A, 1,000-watt Broadcast Transmitter.
Type No. 1–D–B, 1,000-watt Broadcast Transmitter.
Type No. 1–E–A, 1,000-watt Broadcast Transmitter.
Type No. 1–G, 1,000-watt Broadcast Transmitter.
Type No. 1005–B, 5-kw Broadcast Transmitter.
Type No. 1005–C (5–C), 5-kw Broadcast Transmitter.
Type No. 5–C–1, 5-kw Broadcast Transmitter.
Type No. 5–C–B, 5-kw Broadcast Transmitter.
Type No. 5–D, 5-kw Broadcast Transmitter.
Type No. 5–D–1, 5-kw Broadcast Transmitter.
Type No. 5–D–2, 5-kw Broadcast Transmitter.
Type No. 5–DX, 5-kw Broadcast Transmitter.
Type No. A–10–A, 10-kw Power Amplifier.
Type No. 10–C, 10-kw Broadcast Transmitter.
Type No. 10–C–A, 10-kw Broadcast Transmitter.
Type No. 10–C–B, 10-kw Broadcast Transmitter.
Type No. 10–D, 10-kw Broadcast Transmitter.
Type No. 1050–B, 50-kw Broadcast Transmitter.
Type No. 50–C, 50-kw Power Amplifier.
Type No. 50–D, 50-kw Power Amplifier.
Type No. 50–C, 50-kw Broadcast Transmitter.
Type No. 50–D, 50-kw Broadcast Transmitter.
Type No. 500–A, 500-kw Power Amplifier and Modulator Unit.

Radio Engineering Laboratories Inc., 100 Wilbur Ave., Long Island City, N. Y.:

Catalogue No. 285, Automatic Frequency Control Unit.
Catalogue No. 256, 100-watt Broadcast Transmitter.

R. C. Powell & Co. Inc. (No longer in business.)

Type No. 3–K, Automatic Temperature Control Chamber.
Type No. 1–K, Automatic Frequency Control Unit.
Type No. 43–B, 100-watt Broadcast Transmitter.
Type No. 21–K, 250-watt Broadcast Transmitter.
Type No. 8–K, 1,000-watt Broadcast Transmitter.

D. V. Tostenson, Moorhead, Minn.:

Type No. 1–C, Automatic Frequency Control Unit.
Type No. 2–C, Automatic Frequency Control Unit.
Type No. 3–B, Automatic Temperature Control Chamber.
Type No. 101–B, 100-watt Broadcast Transmitter.
Type No. 250–B, 250-watt Broadcast Transmitter.

Western Electric Company, 195 Broadway, New York City:

Type No. 700–A, Automatic Frequency Control Unit.
Type No. 700–B, Automatic Frequency Control Unit.
Type No. 702–A, Automatic Frequency Control Unit.
Type No. D–90684, Automatic Frequency Control Unit.
Type No. 20–A, 100/250-watt Broadcast Transmitter.
Type No. 301–A, 100-watt Broadcast Transmitter.
Type No. 12–A, former code number.
Type No. 302–A, 250-watt Broadcast Transmitter.
Type No. 303–A, 500-watt Broadcast Transmitter.
Type No. 304–A, 1-kw. Broadcast Transmitter.
Type No. 301–B, 100-watt Broadcast Transmitter.
Type No. 12–B, former code number.
Type No. 302–B, 250-watt Broadcast Transmitter.
Type No. 303–B, 500-watt Broadcast Transmitter.
Type No. 304–B, 1-kw Broadcast Transmitter.
Type No. 302–C, 250-watt Broadcast Transmitter.
Type No. 303–C, 500-watt Broadcast Transmitter.
Type No. 304–C, 1,000-watt Broadcast Transmitter.
Type No. 306–A, 50-kw Broadcast Transmitter.
Type No. 306–B, 50-kw Broadcast Transmitter.
Type No. 310–A, 100-watt Broadcast Transmitter.
Type No. 310–B, 250-watt Broadcast Transmitter.
Type No. 310–C, 500-watt Broadcast Transmitter.
Type No. 310–D, 1,000-watt Broadcast Transmitter.
Type No. 350C–1, 100-watt Broadcast Transmitter.
Type No. 351E–1, 250-watt Broadcast Transmitter.
Type No. 352E–1, 500-watt Broadcast Transmitter.
Type No. 353A–1, 1-kw Broadcast Transmitter.
Type No. 353B–1, 1-kw Broadcast Transmitter.
Type No. 353C–1, 1-kw Broadcast Transmitter.
Type No. 353D–1, 1-kw Broadcast Transmitter.
Type No. 353E–1, 1-kw Broadcast Transmitter.
Type No. 355B–1, 5-kw Broadcast Transmitter (Type No. 301B transmitter with D–97088 amplifier).
Type No. 355D–1, 5-kw Broadcast Transmitter (Former Type No. 5-kw AC).

Type No. 355E-1, 5-kw Broadcast Transmitter.
Type No. 403A-1, 1-kw Broadcast Transmitter.
Type No. 405A-1, 5-kw Broadcast Transmitter.
Type No. 405B-1, 5-kw Broadcast Transmitter.
Type No. 406A-1, 10-kw Broadcast Transmitter.
Type No. 407-A-1, 50-kw Broadcast Transmitter.
Type No. 407-A-2, 50-kw Broadcast Transmitter.
Type No. 407-A-3, 50-kw Broadcast Transmitter.
Type No. 407-A-4, 50-kw Broadcast Transmitter.
Type No. D94989, 5-kw Broadcast Transmitter.
Type No. D-94990, 5-kw Broadcast Transmitter.
Type No. D-94991, 5-kw Broadcast Transmitter.
Type No. D-94992, 5-kw Broadcast Transmitter.
Type No. D-94993, 1-kw Broadcast Transmitter.
Type No. D-94994, 1-kw Broadcast Transmitter.
Type No. D-94995, 50-kw Broadcast Transmitter.
Type No. D-96020, 1-kw Broadcast Transmitter.
Type No. D-96021, 1-kw Broadcast Transmitter.
Type No. D-97088, 5-kw Power Amplifier (may be used with 301-A or B, 302-A or B, 303-A or B or 304-A or B).
Type No. D-97088, Modified for 2½ kw Broadcast Transmitter.
Type No. D-96847, 5-kw Broadcast Transmitter.
Type No. D-96847, Modified 2½-kw Broadcast Transmitter.

Western Radio Engineering Company Inc., 5th and St. Peter St., St. Paul, Minn.:

Type No. F-100-A, Automatic Frequency Control Unit.

24. STANDARD BROADCAST APPLICATION FORMS

The Communications Act of 1934, as amended, and the Rules and Regulations of the Commission require that an application be made to the Commission for various authorizations. In order to be of aid to applicants there is set out below the correct forms to be submitted in making application for various authorizations applicable to standard broadcast stations.

In general, these forms shall be completed in full, answering each specific section. The only exception is in the technical sections when in the case of standard equipment which has been approved by type number by the Commission or when no change in such equipment is involved, in which cases, the manufacturer's name and type number of the approved equipment may be stated, or should be answered "no change" in each section applicable. All applications involving actual operation, such as license to cover construction permit, renewal of license, etc., shall be completed in full, regardless of whether such information has been previously filed with the Commission.

F. C. C. Form 301—Application for Standard Broadcast Station, Construction Permit or Modification Thereof shall be used for all applications for authority:

(1) To erect a new standard broadcast station.

(2) For any change in assignment involving construction as listed in (3) to (9) below:

(3) To install new transmitter.

(4) To make changes in existing equipment with respect to system of modulation.

(5) To change type of vacuum tubes in the last radio stage except to tubes of the same rating in accordance with Release "Power Rating of Vacuum Tubes."

(6) To change number of vacuum tubes in the last radio stage.

(7) To make any other change affecting the maximum-rated carrier power or type number of equipment.

(8) To change location of an existing transmitter or for approval of location previously authorized to be determined subject to Commission approval.

(9) To install directional antenna system.

(10) For modification of any outstanding construction permit which has not been covered by license.

F. C. C. Form 302—Application for Standard Broadcast Station License shall be used for all applications for license:

(1) To cover construction permit.

(2) To use the former main transmitter as the auxiliary transmitter when no new construction is involved.

(3) For regular authorization covering special experimental authorization.

F. C. C. Form 303—Application for Renewal of Standard Broadcast Station License shall be used for all applications for renewal of regular licenses of all standard broadcast stations.

F. C. C. Form 304—Application for Modification of Standard Broadcast Station License shall be used for all applications for modification of any term of an existing regular license of a standard broadcast station where a construction permit is not required:

(1) Change of frequency.

(2) Change of power where the equipment at present installed is capable of satisfactory operation at the proposed power.

(3) Change of time of operation.

(4) Change of location of main studio. (See Rule 31.11.)

(5) Change name of licensee where no change of ownership is involved.

F. C. C. Form 305—Application for Authorization to Install Automatic Frequency Control shall be used in making application for authority:

(1) To install new automatic frequency control equipment.

(2) To install new automatic temperature control chamber.

(3) Any other change affecting the accuracy or stability of the operating frequency of a standard broadcast station where an application for construction permit as above listed is not required.

F. C. C. Form 306—Application to Determine Operating Power of Broadcast Station by Direct Measurement of Antenna Power shall be used in making all applications for authority to determine power by the direct method.

F. C. C. Form 307—Application for Standard Broadcast Station Experimental Authorization or Extension Thereof shall be used in making application for—

(1) Any special experimental authorization under Rule 31.12.

(2) Any extension thereof.

NOTE: Attention is invited to Note 2 of F. C. C. Form 307 which reads: "Give detailed description by completing F. C. C. Forms 301, Sections 17, 18, 19 and 20, or 305, Sections 6 and 7, and any other form if more complete engineering description of proposed equipment can be given thereby."

F. C. C. Form 308—Application for Permit to Locate, Maintain or use Studio Apparatus for Production of Programs to be Transmitted or Delivered to Foreign Radio Stations shall be used in making application for all authorizations under Section 325 (b) of the Communications Act of 1934.

F. C. C. Form 327—Supplemental Statement of Facts Required under Section 308 of the Communications Act of 1934 regarding Station Equipment shall be submitted:

(1) Upon change of frequency authorized by modification of license or special experimental authorization.

(2) With all applications for license to cover construction permits made on F. C. C. Form 302 of issue prior to August 25, 1936.

NOTE: The information required under Sections (e), (f), (g) and (h) shall be obtained from operation during the experimental period and no operation shall occur during the regular broadcast day until the Commission has approved this information, which may be submitted by telegram, provided, F. C. C. Form 327, properly completed and executed, has been deposited in the United States mail and the telegram so states.

F. C. C. Form 701—Application for Additional Time to Construct a Radio Station shall be submitted for all extensions of commencement and/or completion dates of construction permits.

F. C. C. Form 314—Application for Consent to Assignment of Radio Station Construction Permit or License shall be used in all such cases in accordance with Rule 15.14.

F. C. C. Form 315—Application for Consent to Transfer of Control of Corporation Holding Construction Permit or Station License shall be used in all such cases in accordance with Rule 15.14.

F. C. C. Form 316—Inventory of Station Property shall be submitted with and as part of F. C. C. Forms 314 and 315 in accordance with requirements of Rule 15.14.

F. C. C. Form 705—Profit and Loss Statement shall be submitted with F. C. C. Forms 314 and 315 in accordance with the requirements of Rule 15.14.

F. C. C. Form 706—Balance Sheet shall be submitted with applications:

(1) For Construction Permit for a new Broadcast Station.

(2) For substantial changes for Existing Station.

(3) For consent to Assignment of Radio Station Construction Permit or License by

(a) the Assignor and
(b) the Assignee

(4) For Consent to Transfer of Control of a Licensed Corporation by

(a) the Licensed Corporation and
(b) the Transferee

Informal requests (letters or telegrams) may be filed for requests:

(a) To operate additional time.

(b) To discontinue operation or services not covered by Rule 34.01.

(c) To operate with additional power.

(d) To operate with reduced power not covered by Rule 33.10.

(e) To operate for test purposes (to determine site, etc.).

(f) To rebroadcast programs of stations of other classes.

(g) Other special temporary operation beyond terms of existing license.

(h) Temporary operation without specified items of equipment, or with temporary, substitute or auxiliary equipment.

(1) Operation without an approved frequency monitor.

(2) Operation without an approved modulation monitor.

(3) Operation without thermometer in automatic temperature control chamber.

(4) Operation without antenna ammeter, plate voltmeter or plate ammeter.

(5) Operation with substitute ammeter, plate voltmeter or plate ammeter.

(6) Operation with temporary antenna system.

(7) Operation with auxiliary transmitter as main transmitter.

(i) Operation with new or modified equipment pending repair of existing equipment, or pending receipt and action upon a formal application.

(j) Where formal application is not required, application for new or modified equipment or antenna system.

(k) Change of specifications for painting and lighting antenna towers where formal application is not required.

(l) Operation to determine power by direct method during program test period.

(m) Relocation of transmitter in same building.

(n) Operation with reduced power or time under Rules 33.10 and 34.01.

(o) Approval of types of equipment as to compliance with outstanding rules or standards.

(p) All authorizations for equipment and program tests, or extensions thereof, where it appears that compliance has been had with the terms of the construction permit.

(q) Denial of requests for equipment and program tests where specifications of construction permit have not been met.

(r) Withdrawal of authorizations for equipment and program tests where subsequent to the issuance of the original authorizations it appears that the terms of the construction permit have not been met.

(s) Extensions of time within which to comply with technical requirements specified in authorizations, orders and rules or releases of the Commission.

(t) Representations of compliance with technical requirements specified in authorizations, orders, rules or releases (except formal applications).

(u) Operation with licensed, new or modified equipment at a temporary location with a temporary antenna system in case of an emergency when, due to causes beyond the control of the licensee, it becomes impossible to continue operating at the licensed location.

25. FIELD OFFICES OF THE COMMISSION

Section 3.57 and other rules of the Commission require that in certain instances, the Inspector in Charge of the district in which the station is located, be advised of the conditions existing at the station. The following is a list of the radio districts giving the address of each field office of the Commission and the territory embraced in each district:

Radio district	Address of the inspector in charge	Territory within district	
		States	Counties
1	Customhouse, 7th Floor, Boston, Mass.	Connecticut	All counties.
		Maine	Do.
		Massachusetts	Do.
		New Hampshire	Do.
		Rhode Island	Do.
		Vermont	Do.
2	748 Federal Bldg., 641 Washington St., New York, N. Y.	New Jersey	Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, and Warren.
		New York	Albany, Bronx, Columbia, Delaware, Dutchess, Greene, Kings, Nassau, New York, Orange, Putnam, Queens, Rensselaer, Richmond, Rockland, Schenectady, Suffolk, Sullivan, Ulster, and Westchester.
3	Room 1200, New U. S. Customhouse, 2nd & Chestnut Sts., Philadelphia, Pa.	Delaware	Newcastle.
		New Jersey	Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Ocean, and Salem.
		Pennsylvania	Adams, Berks, Bucks, Carbon, Chester, Cumberland, Dauphin, Delaware, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Perry, Philadelphia, Schuylkill, and York.
4	Fort McHenry, Baltimore, Md.	Delaware	Kent and Sussex.
		District of Columbia	All counties.
		Maryland	Do.
		Virginia	Arlington, Clark, Fairfax, Fauquier, Frederick, Loudoun, Page, Prince, William Rappahannock, Shenandoah, and Warren.
5	Room 402, New P. O. Bldg., Norfolk, Va.	North Carolina	All except district 6.
		Virginia	All except district 4.
6	411 Federal Annex, Atlanta, Ga.	Alabama	All counties except Baldwin and Mobile.
		Georgia	Do.
		North Carolina	Ashe, Avery, Buncombe, Burke, Caldwell, Cherokee, Clay, Cleveland, Graham, Haywood, Henderson, Jackson, McDowell, Macon, Madison, Mitchell, Polk, Rutherford, Swain, Transylvania, Watauga, and Yancey.
		South Carolina	All counties.
		Tennessee	Do.
	Suboffice, 208 P. O. Bldg., Savannah, Ga.		
7	P. O. Box 150, Miami, Fla.	Florida	All counties except Escambia.
	Suboffice, 203 Post Office Bldg., Tampa, Fla.		
8	326 Customhouse, New Orleans, La.	Alabama	Baldwin and Mobile.
		Arkansas	All counties.
		Florida	Escambia.
		Louisiana	All counties.
		Mississippi	Do.
		Texas	City of Texarkana only.
9	Room 404, Federal Bldg., Galveston, Texas.	Texas	Aransas, Brazoria, Brooks, Calhoun, Cameron, Chambers, Fort Bend, Galveston, Goliad, Harris, Hidalgo, Jackson, Jefferson, Jim Wells, Kenedy, Kleberg, Matagorda, Nueces, Refugio, San Patricio, Victoria, Wharton, and Willacy.
10	302 U. S. Terminal Annex Bldg., Dallas, Texas.	New Mexico	All counties.
		Oklahoma	Do.
		Texas	All except district 9 and the city of Texarkana.

Radio district	Address of the inspector in charge	Territory within district: States	Territory within district: Counties
11	1105 Rives-Strong Bldg., Los Angeles, Calif.	Arizona	All counties.
		California	Imperial, Inyo, Kern, Los Angeles, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, and Ventura.
		Nevada	Clarke.
	Suboffice, Room 503, New California Bldg., San Diego, Calif.		
12	328 Customhouse, San Francisco, Calif.	California	All except district 11.
		Nevada	All except Clarke.
		Guam.	
		Midway.	
		Wake.	
		American Samoa.	
13	207 New U. S. Courthouse, Portland, Oregon.	Idaho	All except district 14.
		Oregon	All counties.
14	808 Federal Office Bldg., Seattle, Wash.	Alaska.	
		Idaho	Benewah, Bonner, Boundary, Clearwater, Idaho, Kootenai, Latah, Lewis, Nez Perce, and Shoshone.
		Montana	Beaverhead, Broadwater, Cascade, Deerlodge, Flathead, Gallatin, Glacier, Granite, Jefferson, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Pondera, Powell, Ravalli, Sanders, Silver Bow, Teton, and Toole.
		Washington	All counties.
	Suboffice, P. O. Box 2719 (313 Federal Bldg.), Juneau, Alaska.		
15	504 Customhouse, Denver, Colo.	Colorado	Do.
		Montana	All except District 14.
		Utah	All counties.
		Wyoming	Do.
16	927 Main P. O. Bldg., St. Paul, Minn.	Minnesota	Do.
		Michigan	Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon, and Schoolcraft.
		North Dakota	All counties.
		South Dakota	Do.
		Wisconsin	All except district 18.
17	609 Pickwick Bldg., 903 McGee St., Kansas City, Mo.	Iowa	Do.
		Kansas	All counties.
		Missouri	Do.
		Nebraska	Do.
18	246 U. S. Courthouse Bldg., Chicago, Ill.	Illinois	All counties.
		Indiana	Do.
		Iowa	Allamakee, Buchanan, Cedar, Clayton, Clinton, Delaware, Des Moines, Dubuque, Fayette, Henry Jackson, Johnson, Jones, Lee, Linn, Louisa, Muscatine, Scott, Washington, and Winneshiek.
		Wisconsin	Columbia, Crawford, Dane, Dodge, Grant, Green, Iowa, Jefferson, Kenosha, Lafayette, Milwaukee, Ozaukee, Racine, Richland, Rock, Sauk, Walworth, Washington, and Waukesha.
19	1025 New Federal Bldg., Detroit, Mich.	Kentucky	All counties.
		Michigan	All except district 16.
		Ohio	All counties.
		West Virginia	Do.
20	518 Federal Bldg., Buffalo, N. Y.	New York	All except district 2.
		Pennsylvania	All except district 3.
21	Aloha Tower, Honolulu, T. H.	Territory of Hawaii.	
22	P. O. Box 1353 (303 Ochoa Bldg.) San Juan, Puerto Rico.	Puerto Rico.	
		Virgin Islands.	

26. AVERAGE SUNSET TIME

Section 3.8 states that the term "sunset" means for each particular station during any particular month, the average time of sunset as specified in the license of a broadcast station. The following is a tabulation of the average time of sunset for each month at various points:

(E) Eastern standard time, (C) Central, (M) Mountain, (P) Pacific.

	Month: January	February	March	April	May	June	July	August	September	October	November	December
Aberdeen, S. Dak. (C)	5:15	6:00	6:45	7:15	8:00	8:30	8:15	7:45	6:45	5:45	5:00	4:45
Aberdeen, Wash. (P)	4:45	5:45	6:15	7:00	7:45	8:15	8:15	7:30	6:30	5:30	4:45	4:30
Abilene, Kans. (C)	5:30	6:00	6:30	7:00	7:30	8:00	8:00	7:30	6:45	5:45	5:15	5:15
Abilene, Tex. (C)	6:00	6:30	6:45	7:15	7:30	7:45	7:45	7:30	6:45	6:15	5:45	5:30
Ada, Okla. (C)	5:45	6:15	6:30	7:00	7:30	7:45	7:45	7:15	6:30	6:00	5:30	5:15
Akron, Ohio (C)	4:15	5:00	5:30	6:00	6:30	7:00	7:00	6:30	5:30	4:45	4:15	4:00
Albany, Ga. (C)	5:00	5:30	5:45	6:00	6:30	6:45	6:45	6:15	5:45	5:00	4:45	4:30
Albany, N. Y. (E)	4:45	5:30	6:00	6:30	7:15	7:30	7:30	7:00	6:00	5:15	4:30	4:15
Albert Lea, Minn. (C)	5:00	5:45	6:15	7:00	7:30	8:00	8:00	7:15	6:30	5:30	4:45	4:30
Albuquerque, N. Mex. (M)	5:15	5:45	6:15	6:45	7:00	7:15	7:15	7:00	6:15	5:30	5:00	5:00
Alexandria, La. (C)	5:30	6:00	6:15	6:30	7:00	7:15	7:15	7:00	6:15	5:45	5:15	5:15
Altoona, Pa. (E)	5:15	5:45	6:15	6:45	7:15	7:45	7:45	7:15	6:30	5:30	5:00	4:45
Americus, Ga. (E)	6:00	6:30	6:45	7:00	7:30	7:45	7:45	7:15	6:45	6:00	5:30	5:30
Ames, Iowa (C)	5:00	5:45	6:15	7:00	7:30	7:45	7:45	7:15	6:30	5:30	5:00	4:45
Anderson, Ind. (C)	4:45	5:15	5:45	6:15	6:45	7:15	7:15	6:45	6:00	5:00	4:30	4:15
Annapolis, Md. (E)	5:00	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	5:00	4:45
Anniston, Ala. (C)	5:00	5:30	5:45	6:15	6:30	7:00	7:00	6:30	5:45	5:15	4:45	4:30
Ardmore, Okla. (C)	5:45	6:15	6:30	7:00	7:30	7:45	7:45	7:15	6:30	6:00	5:30	5:15
Ashland, Ky. (C)	4:30	5:15	5:30	6:00	6:30	7:00	7:00	6:30	5:45	5:00	4:15	4:15
Ashtabula, Ohio (E)	5:15	6:00	6:30	7:00	7:30	8:00	8:00	7:30	6:30	5:45	5:00	5:00
Astoria, Oreg. (P)	5:00	5:45	6:15	7:00	7:45	8:15	8:00	7:30	6:30	5:30	4:45	4:30
Atchison, Kans. (C)	5:15	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:00	5:00
Athens, Ga. (E)	5:45	6:15	6:45	7:00	7:30	7:45	7:45	7:15	6:45	6:00	5:30	5:30
Atlanta, Ga. (C)	4:45	5:15	5:45	6:15	6:30	6:45	6:45	6:30	5:45	5:00	4:30	4:30
Atlantic City, N. J. (E)	5:00	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
Auburn, N. Y. (E)	5:00	5:30	6:15	6:45	7:15	7:45	7:45	7:15	6:15	5:30	4:45	4:30
Augusta, Ga. (E)	5:45	6:15	6:30	7:00	7:15	7:45	7:45	7:15	6:30	6:00	5:30	5:15
Augusta, Maine (E)	4:30	5:00	5:45	6:15	7:00	7:30	7:15	6:45	5:45	5:00	4:15	4:00
Aurora, Ill. (C)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:30	4:30
Austin, Tex. (C)	5:45	6:15	6:45	7:00	7:15	7:30	7:30	7:15	6:45	6:00	5:30	5:30
Baker, Oreg. (P)	4:30	5:15	6:00	6:30	7:15	7:45	7:30	7:00	6:00	5:15	4:30	4:15
Baltimore, Md. (E)	5:00	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	5:00	4:45
Bangor, Maine (E)	4:15	5:00	5:45	6:15	7:00	7:15	7:15	6:45	5:45	4:45	4:15	4:00
Baton Rouge, La. (C)	5:30	5:45	6:15	6:30	6:45	7:15	7:15	6:45	6:15	5:30	5:15	5:00
Bay City, Mich. (E)	5:30	6:00	6:45	7:15	8:00	8:15	8:15	7:45	6:45	6:00	5:15	5:30
Beaumont, Tex. (C)	5:45	6:00	6:30	6:45	7:00	7:15	7:15	7:00	6:30	5:45	5:15	5:15
Beckley, W. Va. (E)	5:30	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:15	5:15
Bend, Oreg. (P)	4:45	5:30	6:15	6:45	7:30	7:45	7:45	7:15	6:15	5:30	4:45	4:30
Berkeley, Calif. (P)	5:15	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	5:00	4:45
Berrien Springs, Mich. (E)	5:30	6:15	6:45	7:30	8:00	8:15	8:15	7:45	7:00	6:00	5:30	5:15
Beverly Hills, Calif. (P)	5:00	5:30	6:00	6:30	6:45	7:00	7:00	6:45	6:00	5:15	4:45	4:45
Billings, Mont. (M)	5:00	5:45	6:15	7:00	7:30	8:00	8:00	7:30	6:30	5:30	4:45	4:30
Binghamton, N. Y. (E)	5:00	5:30	6:15	6:45	7:15	7:45	7:45	7:00	6:15	5:30	4:45	4:30
Birmingham, Ala. (C)	5:00	5:30	6:00	6:15	6:45	7:00	7:00	6:30	6:00	5:15	4:45	4:45
Bismarck, N. Dak. (C)	5:15	6:00	6:45	7:30	8:15	8:45	8:30	8:00	7:00	6:00	5:15	5:00
Bluefield, W. Va. (E)	5:30	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:15	5:15
Blytheville, Ark. (C)	5:15	5:45	6:00	6:30	7:00	7:15	7:15	6:45	6:15	5:30	5:00	4:45
Boise, Idaho (M)	5:30	6:15	6:45	7:30	8:00	8:30	8:30	7:45	7:00	6:00	5:15	5:15
Boston, Mass. (E)	4:30	5:15	5:45	6:30	7:00	7:15	7:15	6:45	6:00	5:00	4:30	4:15
Bozeman, Mont. (M)	5:00	5:45	6:30	7:15	7:45	8:15	8:15	7:30	6:45	5:45	5:00	4:45
Brady, Tex. (C)	6:00	6:30	6:45	7:00	7:30	7:45	7:45	7:15	6:45	6:00	5:45	5:30
Bridgeport, Conn. (E)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:30	4:30
Bridgeton, N. J. (E) (Upper Deerfield)	5:00	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:30	4:45	4:45
Bronx, N. Y. (E)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:45	4:30
Brookings, S. Dak. (C)	5:15	6:00	6:30	7:15	7:45	8:15	8:15	7:30	6:45	5:45	5:00	4:45

	Month											
	January	February	March	April	May	June	July	August	September	October	November	December
Brooklyn, N. Y. (E)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:45	4:30
Buffalo, N. Y. (E)	5:00	5:45	6:15	7:00	7:30	8:00	8:00	7:15	6:30	5:30	5:00	4:45
Burlington, Vt. (E)	4:45	5:15	6:00	6:30	7:15	7:45	7:30	7:00	6:00	5:15	4:30	4:15
Butte, Mont. (M)	5:15	6:00	6:30	7:15	8:00	8:15	8:15	7:45	6:45	5:45	5:00	4:45
Calumet, Mich. (C)	4:30	5:15	6:00	6:45	7:30	7:45	7:45	7:00	6:15	5:15	4:15	4:00
Cambridge, Mass. (E)	4:30	5:15	5:45	6:30	7:00	7:30	7:15	6:45	6:00	5:00	4:30	4:15
Camden, N. J. (E)	5:00	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
Canton, N. Y. (E)	4:45	5:30	6:00	6:45	7:15	7:45	7:45	7:00	6:15	5:15	4:30	4:15
Canton, Ohio (E)	5:15	6:00	6:30	7:00	7:30	8:00	8:00	7:30	6:30	5:45	5:15	5:00
Carbondale, Pa. (E)	5:00	5:30	6:15	6:45	7:15	7:45	7:30	7:00	6:15	5:15	4:45	4:30
Carlsbad, N. Mex. (M)	5:15	5:45	6:00	6:30	6:45	7:00	7:00	6:45	6:00	5:30	5:00	5:00
Carson City, Nev. (P)	5:00	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
Carthage, Ill. (C)	5:00	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	4:45	4:45
Cedar Rapids, Iowa (C)	5:00	5:45	6:15	6:45	7:15	7:45	7:45	7:15	6:15	5:30	4:45	4:30
Champaign, Ill. (C)	4:45	5:30	6:00	6:30	7:00	7:30	7:15	6:45	6:00	5:15	4:45	4:30
Charleston, W. Va. (E)	5:30	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:15	5:15
Charlotte, N. C. (E)	5:30	6:00	6:30	7:00	7:15	7:45	7:45	7:15	6:30	5:45	5:15	5:15
Charlottesville, Va. (E)	5:15	5:45	6:15	6:45	7:15	7:45	7:30	7:15	6:30	5:45	5:00	5:00
Chattanooga, Tenn. (C)	4:45	5:30	5:45	6:15	6:30	7:00	7:00	6:30	5:45	5:15	4:30	4:30
Cheyenne, Wyo. (M)	5:00	5:30	6:00	6:45	7:15	7:30	7:30	7:00	6:15	5:15	4:45	4:30
Chicago, Ill. (C)	4:45	5:15	6:00	6:30	7:00	7:30	7:30	6:45	6:00	5:15	4:30	4:15
Chickasha, Okla. (C)	5:45	6:15	6:45	7:00	7:30	7:45	7:45	7:15	6:45	6:00	5:30	5:15
Chico, Calif. (P)	5:00	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	5:00	4:45
Cicero, Ill. (C)	4:45	5:15	6:00	6:30	7:00	7:30	7:30	6:45	6:00	5:15	4:30	4:15
Cincinnati, Ohio (E)	5:45	6:15	6:45	7:15	7:45	8:00	8:00	7:30	6:45	6:00	5:30	5:15
Clarinda, Iowa (C)	5:15	6:00	6:30	7:00	7:30	8:00	7:45	7:15	6:30	5:45	5:00	5:00
Clarksburg, W. Va. (E)	5:15	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:15	5:00
Clay Center, Nebr. (C)	5:30	6:00	6:45	7:15	7:45	8:00	8:00	7:30	6:45	6:00	5:15	5:00
Clayton, Mo. (C)	5:00	5:45	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:30	4:45	4:45
Clearwater, Fla. (E)	6:00	6:15	6:45	7:00	7:15	7:30	7:30	7:15	6:30	6:00	5:45	5:30
Cleveland, Ohio (E)	5:15	6:00	6:30	7:00	7:45	8:00	8:00	7:30	6:45	5:45	5:15	5:00
Clovis, N. Mex. (M)	5:30	5:45	6:00	6:15	6:30	6:45	6:45	6:30	6:00	5:30	5:00	5:00
Coffeyville, Kans. (C)	5:30	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:15	5:00
Columbia, Mo. (C)	5:15	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	5:00	4:45
Columbia, S. C. (E)	5:30	6:00	6:30	7:00	7:15	7:30	7:30	7:15	6:30	5:45	5:15	5:15
Columbus, Ga. (C)	5:00	5:30	5:45	6:15	6:30	6:45	6:45	6:30	5:45	5:15	4:45	4:30
Columbus, Ohio (E)	5:30	6:00	6:45	7:15	7:45	8:00	8:00	7:30	6:45	6:00	5:15	5:15
Concord, N. H. (E)	4:30	5:15	5:45	6:30	7:00	7:30	7:30	6:45	6:00	5:00	4:30	4:15
Connersville, Ind. (C)	4:45	5:15	5:45	6:15	6:45	7:15	7:00	6:30	5:45	5:00	4:30	4:15
Corpus Christi, Tex. (C)	6:00	6:15	6:45	7:00	7:15	7:30	7:30	7:15	6:30	6:00	5:45	5:30
Corsicana, Tex. (C)	5:45	6:15	6:30	7:00	7:15	7:30	7:30	7:15	6:30	6:00	5:30	5:30
Council Bluffs, Iowa (O)	5:15	6:00	6:30	7:00	7:30	8:00	8:00	7:30	6:30	5:45	5:00	5:00
Couer D'Alene, Idaho (P)	4:15	5:15	5:45	6:30	7:15	7:45	7:45	7:00	6:00	5:00	4:15	4:00
Culver City, Calif. (P)	5:00	5:30	6:00	6:30	6:45	7:00	7:00	6:45	6:00	5:15	4:45	4:45
Cumberland, Md. (E)	5:15	5:45	6:15	6:45	7:15	7:45	7:45	7:15	6:30	5:30	5:00	4:45
Dallas, Tex. (C)	5:45	6:15	6:30	7:00	7:15	7:30	7:30	7:15	6:30	6:00	5:30	5:15
Danville, Ill. (C)	4:45	5:30	6:00	6:30	7:00	7:15	7:15	6:45	6:00	5:15	4:30	4:30
Danville, Va. (E)	5:30	6:00	6:30	6:45	7:15	7:30	7:30	7:15	6:30	5:45	5:15	5:00
Davenport, Iowa (C)	5:00	5:30	6:15	6:45	7:15	7:45	7:30	7:00	6:15	5:15	4:45	4:30
Dayton, Ohio (E)	5:30	6:15	6:45	7:15	7:45	8:00	8:00	7:30	6:45	6:00	5:15	5:15
Daytona Beach, Fla. (E)	5:45	6:15	6:30	6:45	7:15	7:30	7:30	7:00	6:30	6:00	5:30	5:30
Decatur, Ala. (C)	5:00	5:30	6:00	6:15	6:45	7:00	7:00	6:30	6:00	5:15	4:45	4:45
Decorah, Iowa (C)	5:00	5:30	6:15	6:45	7:30	7:45	7:45	7:15	6:15	5:30	4:45	4:30
Denton, Tex. (C)	5:45	6:15	6:30	7:00	7:15	7:45	7:45	7:15	6:30	6:00	5:30	5:30
Denver, Colo. (M)	5:00	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
Des Moines, Iowa (C)	5:00	5:45	6:15	7:00	7:30	7:45	7:45	7:15	6:30	5:30	5:00	4:45
Detroit, Mich. (E)	5:30	6:00	6:45	7:15	7:45	8:15	8:15	7:30	6:45	5:45	5:15	5:00
Devils Lake, N. Dak. (C)	5:15	6:00	6:45	7:30	8:00	8:30	8:30	7:45	6:45	5:45	5:00	4:45
Dothan, Ala. (C)	5:00	5:30	5:45	6:15	6:30	6:45	6:45	6:30	5:45	5:15	4:45	4:45
Dover, Del. (E)	5:00	5:45	6:15	6:45	7:00	7:30	7:30	7:00	6:15	5:30	4:45	4:45
Dublin, Tex. (C)	5:45	6:15	6:45	7:00	7:30	7:45	7:45	7:15	6:45	6:00	5:30	5:30
Dubuque, Iowa (C)	5:00	5:30	6:15	6:45	7:15	7:45	7:45	7:00	6:15	5:30	4:45	4:30
Duluth, Minn. (C)	4:45	5:30	6:15	7:00	7:30	8:00	8:00	7:15	6:15	5:30	4:30	4:15
Durham, N. C. (E)	5:30	6:00	6:30	6:45	7:15	7:30	7:30	7:00	6:30	5:45	5:15	5:00
East Dubuque, Ill. (C)	5:00	5:30	6:15	6:45	7:15	7:45	7:45	7:00	6:15	5:15	4:45	4:30
East Lansing, Mich. (E)	5:30	6:15	6:45	7:15	8:00	8:15	8:15	7:45	6:45	6:00	5:15	5:00
Easton, Pa. (E)	5:00	5:30	6:00	6:45	7:15	7:30	7:30	7:00	6:15	5:15	4:45	4:30
E. St. Louis, Ill. (C)	5:00	5:45	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:30	4:45	4:45
Eau Claire, Wisc. (C)	4:45	5:30	6:15	6:45	7:30	8:00	7:45	7:15	6:15	5:30	4:45	4:30
Elizabeth, N. J. (E)	5:00	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
Elkhart, Ind. (C)	4:30	5:15	5:45	6:30	7:00	7:15	7:15	6:45	6:00	5:00	4:30	4:15
Elkins Park, Pa. (E)	5:00	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
El Paso, Tex. (C)	6:30	6:45	7:15	7:30	8:00	8:15	8:15	7:45	7:15	6:30	6:00	6:00
Elmira, N. Y. (E)	5:00	5:45	6:15	6:45	7:15	7:45	7:45	7:15	6:15	5:30	4:45	4:30

	Month											
	January	February	March	April	May	June	July	August	September	October	November	December
Emory, Va. (E)	5:30	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:15	5:15
Emporia, Kans. (C)	5:30	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:15	5:00
Enid, Okla. (C)	5:45	6:15	6:45	7:00	7:30	7:45	7:45	7:30	6:45	6:00	5:30	5:15
Erie, Pa. (E)	5:15	5:45	6:30	7:00	7:30	8:00	8:00	7:15	6:30	5:45	5:00	4:45
Eureka, Calif. (P)	5:15	5:45	6:15	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:00	4:45
Evansville, Ind. (C)	5:00	5:30	6:00	6:30	7:00	7:15	7:15	6:45	6:00	5:15	4:45	4:30
Fairmont, W. Va. (E)	5:15	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:00	5:00
Fall River, Mass. (E)	4:45	5:15	5:45	6:30	7:00	7:15	7:15	6:45	6:00	5:00	4:30	4:15
Fayetteville, Ark. (C)	5:30	6:00	6:30	6:45	7:15	7:30	7:30	7:15	6:30	5:45	5:15	5:00
Fergus Falls, Minn. (C)	5:00	5:45	6:30	7:15	7:45	8:15	8:15	7:30	6:45	5:45	4:45	4:45
Flint, Mich. (E)	5:30	6:00	6:45	7:15	7:45	8:15	8:15	7:45	6:45	6:00	5:15	5:00
Florence, Ala. (C)	5:00	5:30	6:00	6:30	6:45	7:00	7:00	6:45	6:00	5:15	4:45	4:45
Florence, S. C. (E)	5:30	6:00	6:30	6:45	7:15	7:30	7:30	7:15	6:30	5:45	5:15	5:15
Fort Dodge, Iowa (C)	5:00	5:45	6:15	7:00	7:30	8:00	8:00	7:15	6:30	5:30	5:00	4:45
Fort Smith, Ark. (C)	5:30	6:00	6:30	6:45	7:15	7:30	7:30	7:15	6:30	5:45	5:15	5:00
Fort Wayne, Ind. (C)	4:30	5:15	5:45	6:15	6:45	7:15	7:15	6:45	5:45	5:00	4:30	4:15
Fort Worth, Texas (C)	5:45	6:15	6:30	7:00	7:15	7:45	7:45	7:15	6:30	6:00	5:30	5:30
Frankfort, Ky. (C)	4:45	5:15	5:45	6:15	6:45	7:00	7:00	6:30	5:45	5:00	4:30	4:15
Frederick, Md. (E)	5:15	5:45	6:15	6:45	7:15	7:45	7:30	7:00	6:15	5:30	5:00	4:45
Fresno, Calif. (P)	5:00	5:45	6:00	6:30	7:00	7:15	7:15	6:45	6:15	5:30	4:45	4:45
Gadsden, Ala (C)	5:00	5:30	5:45	6:15	6:45	7:00	7:00	6:30	6:00	5:15	4:45	4:30
Gainesville, Fla. (E)	5:45	6:15	6:30	7:00	7:15	7:30	7:30	7:15	6:30	6:00	5:30	5:30
Galesburg, Ill. (C)	5:00	5:30	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	4:45	4:30
Gallup, N. Mex. (M)	5:30	6:00	6:15	6:45	7:15	7:30	7:30	7:00	6:30	5:45	5:15	5:00
Galveston, Tex. (C)	5:45	6:15	6:30	6:45	7:00	7:15	7:15	7:00	6:30	5:45	5:30	5:15
Gary, Ind. (C)	4:45	5:15	6:00	6:30	7:00	7:30	7:15	6:45	6:00	5:15	4:30	4:15
Gastonia, N. C. (E)	5:30	6:00	6:30	7:00	7:15	7:45	7:45	7:15	6:30	5:45	5:15	5:15
Glendale, Calif. (P)	5:00	5:30	6:00	6:30	6:45	7:00	7:00	6:45	6:00	5:15	4:45	4:45
Globe, Ariz. (M)	5:45	6:00	6:30	7:00	7:15	7:30	7:30	7:15	6:30	5:45	5:15	5:15
Grand Forks, N. Dak. (C)	5:00	5:45	6:30	7:15	8:00	8:30	8:30	7:45	6:45	5:45	4:45	4:30
Grand Island, Nebr. (C)	5:30	6:15	6:45	7:15	7:45	8:00	8:00	7:30	6:45	6:00	5:15	5:00
Grand Junction, Colo. (M)	5:15	5:45	6:15	6:45	7:15	7:45	7:45	7:15	6:30	5:30	5:00	5:00
Grand Rapids, Mich. (E)	5:30	6:15	6:45	7:30	8:00	8:30	8:15	7:45	7:00	6:00	5:15	5:15
Great Falls, Mont. (M)	5:00	5:45	6:30	7:15	8:00	8:30	8:15	7:45	6:45	5:45	4:45	4:30
Greeley, Colo. (M)	5:00	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
Green Bay, Wis. (C)	4:30	5:15	6:00	6:30	7:15	7:45	7:30	7:00	6:00	5:15	4:30	4:15
Greenwood, Miss. (C)	5:15	5:45	6:15	6:30	7:00	7:15	7:15	6:45	6:15	5:30	5:00	5:00
Greenfield, Mass. (E)	4:45	5:15	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:30	4:15
Greensbury, Pa. (E)	5:15	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:00	5:00
Greensboro, N. C. (E)	5:30	6:00	6:30	6:45	7:15	7:30	7:30	7:15	6:30	5:45	5:15	5:00
Greenville, Miss. (C)	5:15	5:45	6:15	6:30	7:00	7:15	7:15	6:45	6:15	5:30	5:00	5:00
Greenville, N. C. (E)	5:15	5:45	6:15	6:45	7:00	7:30	7:30	7:00	6:15	5:30	5:00	5:00
Greenville, S. C. (E)	5:45	6:15	6:30	7:00	7:30	7:45	7:45	7:15	6:45	6:00	5:30	5:15
Greenville, Texas (C)	5:45	6:15	6:30	7:00	7:15	7:30	7:30	7:15	6:30	6:00	5:30	5:15
Grenada, Miss. (C)	5:15	5:45	6:00	6:30	7:00	7:15	7:15	6:45	6:15	5:30	5:00	4:45
Griffin, Ga. (C)	4:45	5:15	5:45	6:00	6:30	6:45	6:45	6:30	5:45	5:00	4:30	4:30
Gulfport, Miss. (C)	5:15	5:45	6:00	6:15	6:45	7:00	7:00	6:45	6:00	5:30	5:00	5:00
Hagerstown, Md. (E)	5:15	5:45	6:15	6:45	7:15	7:45	7:45	7:15	6:15	5:30	5:00	4:45
Hammond, Ind. (C)	4:45	5:15	6:00	6:30	7:00	7:30	7:30	6:45	6:00	5:15	4:30	4:15
Harrisburg, Pa. (E)	5:00	5:45	6:15	6:45	7:15	7:45	7:30	7:00	6:15	5:30	4:45	4:45
Harrisonburg, Va. (E)	5:15	6:00	6:15	6:45	7:15	7:45	7:45	7:15	6:30	5:45	5:00	5:00
Hartford, Conn. (E)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:30	4:15
Hattiesburg, Miss. (C)	5:15	5:45	6:00	6:30	6:45	7:00	7:00	6:45	6:00	5:30	5:00	5:00
Havre, Mont. (M)	4:45	5:45	6:30	7:15	7:45	8:30	8:15	7:30	6:30	5:30	4:45	4:30
Helena, Mont. (M)	5:00	5:45	6:30	7:15	8:00	8:30	8:15	7:45	6:45	5:45	5:00	4:45
Hibbing, Minn. (C)	4:45	5:30	6:15	7:00	7:45	8:15	8:00	7:30	6:30	5:30	4:30	4:15
High Point, N. C. (E)	5:30	6:00	6:30	7:00	7:15	7:30	7:30	7:15	6:30	5:45	5:15	5:00
Hobbs, N. Mex. (M)	5:15	5:30	6:00	6:15	6:45	7:00	7:00	6:45	6:00	5:15	4:45	4:45
Hollywood, Calif. (P)	5:00	5:30	6:00	6:30	6:45	7:00	7:00	6:45	6:00	5:15	4:45	4:45
Honolulu, Hawaii (local)	5:45	6:00	6:15	6:15	6:30	6:45	6:45	6:30	6:00	5:30	5:15	5:15
Hot Springs, Ark. (C)	5:30	6:00	6:15	6:45	7:00	7:30	7:30	7:00	6:15	5:45	5:15	5:00
Houston, Tex. (C)	5:45	6:15	6:30	6. 45	7:15	7:30	7:30	7:00	6:30	5:45	5:30	5:30
Hudson Falls, N. Y. (E)	4:45	5:30	6:00	6:30	7:15	7:30	7:30	7:00	6:00	5:15	4:30	4:15
Huntington, W. Va. (E)	5:30	6:00	6:30	7:00	7:30	8:00	8:00	7:30	6:45	6:00	5:15	5:15
Huntsville, Tex. (C)	5:45	6:15	6:30	6:45	7:15	7:30	7:30	7:00	6:30	5:45	5:30	5:30
Huron, S. Dak. (C)	5:15	6:00	6:45	7:15	7:45	8:15	8:15	7:45	6:45	5:45	5:00	5:00
Hyannis, Mass. (E)	4:30	5:15	5:45	6:15	7:00	7:15	7:15	6:45	6:00	5:00	4:45	4:45
Idaho Falls, Idaho (M)	5:15	6:00	6:30	7:15	7:45	8:15	8:15	7:30	6:45	5:45	5:00	4:45
Independence, Mo. (C)	5:15	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:00	5:00
Indianapolis, Ind. (C)	4:45	5:15	5:45	6:15	6:45	7:15	7:15	6:45	6:00	5:00	4:30	4:15
Inglewood, Calif. (P)	5:00	5:30	6:00	6:30	6:45	7:00	7:00	6:45	6:00	5:15	4:45	4:45
Iowa City, Iowa (C)	5:00	5:45	6:15	6:45	7:15	7:45	7:45	7:00	6:15	5:30	4:45	4:30
Ironwood, Mich. (C)	4:45	5:30	6:00	6:45	7:30	8:00	7:45	7:15	6:15	5:15	4:30	4:15
Ithaca, N. Y. (E)	5:00	5:30	6:15	6:45	7:15	7:45	7:45	7:15	6:15	5:30	4:45	4:30

	Month											
	January	February	March	April	May	June	July	August	September	October	November	December
Jackson, Mich. (E)	5:30	6:15	6:45	7:15	7:45	8:15	8:15	7:45	6:45	6:00	5:15	5:00
Jackson, Miss. (C)	5:30	6:00	6:15	6:30	7:00	7:15	7:15	6:45	6:15	5:30	5:15	5:00
Jackson, Tenn. (C)	5:00	5:30	6:00	6:30	6:45	7:15	7:15	6:45	6:00	5:15	4:45	4:45
Jacksonville, Fla. (E)	5:45	6:15	6:30	7:00	7:15	7:30	7:30	7:15	6:30	6:00	5:30	5:30
Jamestown, N. Y. (E)	5:15	5:45	6:30	7:00	7:30	8:00	7:45	7:15	6:30	5:30	5:00	4:45
Janesville, Wis. (C)	4:45	5:30	6:00	6:30	7:15	7:30	7:30	7:00	6:15	5:15	4:30	4:30
Jamestown, N. Dak. (C)	5:15	6:00	6:45	7:15	8:00	8:30	8:30	7:45	6:45	5:45	5:00	4:45
Jefferson City, Mo. (C)	5:15	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	5:00	4:45
Jerome, Ariz. (M)	5:45	6:15	6:30	7:00	7:30	7:45	7:45	7:15	6:30	6:00	5:30	5:15
Jersey City, N. J. (E)	4:45	5:30	6:00	5:30	7:00	7:30	7:30	7:00	6:00	5:15	4:45	4:30
Joliet, Ill. (C)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:30	4:30
Johnson City, Tenn. (C)	4:30	5:15	5:30	6:00	6:30	6:45	6:45	6:15	5:45	5:00	4:45	4:45
Johnstown, Pa. (E)	5:15	5:45	6:15	7:15	7:30	7:45	7:45	7:15	6:30	5:30	5:00	4:45
Joplin, Mo. (C)	5:30	6:00	6:30	6:45	7:15	7:45	7:45	7:15	6:30	5:45	5:15	5:00
Kalamazoo, Mich. (E)	5:30	6:15	6:45	7:15	8:00	8:15	8:15	7:45	7:00	6:00	5:15	5:15
Kansas City, Mo. (C)	5:15	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:00	5:00
Kearney, Nebr. (C)	5:30	6:15	6:45	7:15	7:45	8:15	8:00	7:30	6:45	6:00	5:15	5:15
Kilgore, Tex. (C)	5:30	6:00	6:30	6:45	7:15	7:30	7:30	7:00	6:30	5:45	5:15	5:15
Kinston, N. C. (E)	5:15	6:00	6:15	6:45	7:00	7:30	7:30	7:00	6:15	5:30	5:00	5:00
Knoxville, Tenn. (C)	4:45	5:15	5:45	6:15	6:30	7:00	7:00	6:30	5:45	5:00	4:30	4:30
Kosciusko, Miss. (C)	5:15	5:45	6:00	6:30	6:45	7:15	7:15	6:45	6:00	5:30	5:00	5:00
LaCrosse, Wis. (C)	4:45	5:30	6:15	6:45	7:30	7:45	7:45	7:15	6:15	5:30	4:45	4:30
Lafayette, La. (C)	5:30	6:00	6:15	6:30	7:00	7:15	7:15	6:45	6:15	5:45	5:15	5:15
La Grande, Oreg. (P)	4:30	5:15	6:00	6:30	7:15	7:45	7:45	7:00	6:00	5:15	4:30	4:15
Lake Charles, La. (C)	5:30	6:00	6:15	6:45	7:00	7:15	7:15	7:00	6:15	5:45	5:15	5:15
Lakeland, Fla. (E)	6:00	6:15	6:30	6:45	7:15	7:30	7:30	7:15	6:30	6:00	5:30	5:30
Lansing, Mich. (E)	5:30	6:15	6:45	7:15	8:00	8:15	8:15	7:45	6:45	6:00	5:15	5:00
Lapeer, Mich. (E)	5:15	6:00	6:45	7:15	7:45	8:15	8:15	7:30	6:45	5:45	5:15	5:00
Laredo, Tex. (C)	6:00	6:30	6:45	7:00	7:15	7:30	7:30	7:15	6:45	6:15	5:45	5:45
La Salle, Ill. (C)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
Las Vegas, Nev. (P)	4:45	5:15	5:45	6:15	6:30	7:00	7:00	6:30	5:45	5:00	4:30	4:30
Laurel, Miss. (C)	5:15	5:45	6:00	6:30	6:45	7:00	7:00	6:45	6:00	5:30	5:00	5:00
Lawrence, Kans. (C)	5:15	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:15	5:00
Lawrence, Mass. (E)	4:30	5:15	5:45	6:30	7:00	7:30	7:15	6:45	6:00	5:00	4:30	4:15
Lewiston, Mont. (M)	5:00	5:45	6:15	7:00	7:15	8:15	8:15	7:30	6:30	5:30	4:45	4:30
Lexington, Ky. (C)	4:45	5:15	5:45	6:15	6:45	7:00	7:00	6:30	5:45	5:00	4:30	4:15
Lexington, Mass. (E)	4:30	5:15	5:45	6:30	7:00	7:30	7:15	6:45	6:00	5:00	4:30	4:15
Lima, Ohio (E)	5:30	6:15	6:45	7:15	7:45	8:15	8:00	7:30	6:45	6:00	5:15	5:15
Lincoln, Nebr. (C)	5:30	6:00	6:30	7:00	7:30	8:00	8:00	7:30	6:45	5:45	5:15	5:00
Little Rock, Ark. (C)	5:15	5:45	6:15	6:45	7:00	7:30	7:30	7:00	6:15	5:30	5:00	5:00
Longview, Tex. (C)	5:30	6:00	6:30	6:45	7:15	7:30	7:30	7:00	6:30	5:45	5:15	5:15
Longview, Wash. (P)	4:45	5:30	6:15	7:00	7:30	8:00	8:00	7:30	6:30	5:30	4:45	4:30
Los Angeles, Calif. (P)	5:00	5:30	6:00	6:30	6:45	7:00	7:00	6:45	6:00	5:15	4:45	4:45
Louisville, Ky. (C)	4:45	5:15	5:45	6:15	6:45	7:15	7:00	6:45	6:00	5:00	4:30	4:30
Lowell, Ariz. (M)	5:45	6:00	6:30	6:45	7:15	7:30	7:30	7:00	6:30	5:45	5:15	5:15
Lowell, Mass. (E)	4:30	5:15	5:45	6:30	7:00	7:30	7:15	6:45	6:00	5:00	4:30	4:15
Lubbock, Tex. (C)	6:00	6:30	7:00	7:15	7:45	8:00	8:00	7:30	7:00	6:15	5:45	5:45
Lufkin, Tex. (C)	5:45	6:00	6:30	6:45	7:15	7:30	7:30	7:00	6:30	5:45	5:15	5:15
Lynchburg, Va. (E)	5:15	6:00	6:30	6:45	7:15	7:45	7:45	7:15	6:30	5:45	5:00	5:00
Lynn, Mass. (E)	4:30	5:15	5:45	6:30	7:00	7:30	7:15	6:45	6:00	5:00	4:30	4:15
Macon, Ga. (E)	5:45	6:15	6:45	7:00	7:30	7:45	7:45	7:15	6:45	6:00	5:30	5:30
Madison, Wis. (C)	4:45	5:30	6:00	6:45	7:15	7:45	7:30	7:00	6:15	5:15	4:30	4:30
Manchester, N. H. (E)	4:30	5:15	5:45	6:30	7:00	7:30	7:30	6:45	6:00	5:00	4:30	4:15
Manhattan, Kans. (C)	5:30	6:00	6:30	7:00	7:30	8:00	7:45	7:30	6:30	5:45	5:15	5:00
Manhattan, N. Y. (E)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:45	4:30
Mankato, Minn. (C)	5:00	5:45	6:15	7:00	7:30	8:00	8:00	7:30	6:30	5:30	4:45	4:45
Marquette, Mich. (C)	4:30	5:15	6:00	6:30	7:15	7:45	7:45	7:00	6:00	5:00	4:15	4:00
Marshalltown, Iowa (C)	5:00	5:45	6:15	6:45	7:30	7:45	7:45	7:15	6:30	5:30	4:45	4:45
Mason City, Iowa (C)	5:00	5:45	6:15	7:00	7:30	8:00	7:45	7:15	6:30	5:30	4:45	4:45
Mayaguez, P. R. (A)	6:15	6:30	6:45	6:45	7:00	7:00	7:15	7:00	6:30	6:00	5:45	6:00
Memphis, Tenn. (C)	5:15	5:45	6:00	6:30	7:00	7:15	7:15	6:45	6:15	5:30	5:00	4:45
Merced, Calif. (P)	5:15	5:45	6:15	6:30	7:00	7:30	7:30	7:00	6:15	5:30	5:00	4:45
Meridian, Miss. (C)	5:15	5:45	6:00	6:30	6:45	7:00	7:00	6:45	6:00	5:30	5:00	4:45
Miami, Fla. (E)	5:45	6:15	6:30	6:45	7:00	7:15	7:15	7:00	6:30	6:00	5:30	5:30
Middlesboro, Ky. (C)	4:45	5:15	5:45	6:15	6:30	7:00	7:00	6:30	5:45	5:00	4:30	4:15
Midland, Tex. (C)	6:00	6:30	7:00	7:15	7:45	8:00	8:00	7:30	7:00	6:15	5:45	5:45
Milford, Kans. (C)	5:30	6:00	6:30	7:00	7:30	8:00	8:00	7:30	6:45	5:45	5:15	5:00
Milwaukee, Wis. (C)	4:45	5:15	6:00	6:30	7:15	7:30	7:30	7:00	6:00	5:15	4:30	4:15
Minneapolis, Minn. (C)	5:00	5:45	6:15	7:00	7:30	8:00	8:00	7:15	6:30	5:30	4:45	4:30
Minot, N. Dak. (C)	5:15	6:00	6:45	7:30	8:15	8:45	8:45	8:00	7:00	6:00	5:15	4:45
Mississippi City, Miss. (C)	5:15	5:45	6:00	6:15	6:45	7:00	7:00	6:45	6:00	5:30	5:00	5:00
Missoula, Mont. (M)	5:15	6:00	6:45	7:30	8:00	8:30	8:30	7:45	6:45	5:45	5:00	4:45
Mobile, Ala. (C)	5:15	5:45	6:00	6:15	6:45	7:00	7:00	6:30	6:00	5:30	5:00	5:00
Monroe, La. (C)	5:30	6:00	6:15	6:30	7:00	7:15	7:15	7:00	6:15	5:30	5:00	5:00

	Month											
	January	February	March	April	May	June	July	August	September	October	November	December
Montgomery, Ala. (C)	5:00	5:30	6:00	6:15	6:30	7:00	7:00	6:30	6:00	5:15	4:45	4:45
Montpelier, Vt. (E)	4:30	5:15	6:00	6:30	7:15	7:30	7:30	7:00	6:00	5:15	4:30	4:15
Moorhead, Minn. (C)	5:00	5:45	6:30	7:15	8:00	8:30	8:15	7:45	6:45	5:45	5:00	4:45
Mooseheart, Ill. (C)	4:45	*5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:30	4:30
Muncie, Ind. (C)	4:45	5:15	5:45	6:15	6:45	7:15	7:15	6:45	6:00	5:00	4:30	4:15
Muscatine, Iowa (C)	5:00	5:30	6:15	6:45	7:15	7:45	7:30	7:00	6:15	5:30	4:45	4:30
Muscle Shoals City, Ala. (C)	5:00	5:30	6:00	6:30	6:45	7:00	7:00	6:45	6:00	5:15	4:45	4:45
Muskegon, Mich. (E)	5:30	6:15	6:45	7:30	8:00	8:30	8:30	7:45	7:00	6:00	5:15	5:15
Nampa, Idaho (M)	5:30	6:15	6:45	7:30	8:00	8:30	8:30	7:45	7:00	6:00	5:15	5:15
Nashville, Tenn. (C)	5:00	5:30	6:00	6:15	6:45	7:00	7:00	6:45	6:00	5:15	4:45	4:30
Needham, Mass. (E)	4:30	5:15	5:45	6:30	7:00	7:30	7:15	6:45	6:00	5:00	4:30	4:15
New Albany, Ind. (C)	4:45	5:15	5:45	6:15	6:45	7:15	7:00	6:45	6:00	5:00	4:30	4:30
Newark, N. J. (E)	5:00	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
New Bedford, Mass. (E)	4:30	5:15	5:45	6:30	7:00	7:15	7:15	6:45	6:00	5:00	4:30	4:15
Newburg, N. Y. (E)	4:45	5:30	6:00	6:30	7:15	7:30	7:30	7:00	6:15	5:15	4:45	4:30
New Castle, Pa. (E)	5:15	6:00	6:30	7:00	7:30	8:00	8:00	7:15	6:30	5:45	5:00	5:00
New Haven, Conn. (E)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:30	4:30
New London, Conn. (E)	4:45	5:15	6:00	6:30	7:00	7:30	7:15	6:45	6:00	5:15	4:30	4:15
New Orleans, La. (C)	5:15	5:45	6:15	6:30	6:45	7:00	7:00	6:45	6:00	5:30	5:00	5:00
Newport, R. I. (E)	4:45	5:15	5:45	6:30	7:00	7:15	7:15	6:45	6:00	5:00	4:30	4:15
Newport News, Va. (E)	5:15	5:45	6:15	6:45	7:00	7:30	7:30	7:00	6:15	5:30	5:00	4:45
New York, N. Y. (E)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:45	4:30
Norfolk, Nebr. (C)	5:15	6:00	6:30	7:15	7:45	8:00	8:00	7:30	6:45	5:45	5:15	5:00
Norfolk, Va. (E)	5:15	5:45	6:15	6:45	7:00	7:30	7:30	7:00	6:15	5:30	5:00	4:45
Normal, Ill. (C)	5:00	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
Norman, Okla. (C)	5:45	6:15	6:30	7:00	7:30	7:45	7:45	7:15	6:45	6:00	5:30	5:15
North Platte, Nebr. (C)	5:45	6:15	6:45	7:15	8:00	8:15	8:15	7:45	7:00	6:00	5:30	5:15
Oakland, Calif. (P)	5:15	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	5:00	4:45
Ogden, Utah (M)	5:30	6:00	6:30	7:00	7:45	8:00	8:00	7:30	6:45	5:45	5:15	5:00
Oil City, Pa. (E)	5:15	5:45	6:30	7:00	7:30	8:00	7:45	7:15	6:30	5:45	5:00	4:45
Oklahoma City, Okla. (C)	5:45	6:15	6:30	7:00	7:30	7:45	7:45	7:15	6:45	6:00	5:30	5:15
Okmulgee, Okla. (C)	5:30	6:00	6:30	7:00	7:15	7:45	7:45	7:15	6:30	5:45	5:15	5:15
Olean, N. Y. (E)	5:00	5:45	6:15	7:00	7:30	7:45	7:45	7:15	6:30	5:30	5:00	4:45
Olympia, Wash. (P)	4:45	5:30	6:15	7:00	7:45	8:15	8:00	7:30	6:30	5:30	4:45	4:15
Omaha, Nebr. (C)	5:15	6:00	6:30	7:00	7:30	8:00	8:00	7:30	6:30	5:45	5:00	5:00
Orlando, Fla. (E)	5:45	6:15	6:30	6:45	7:15	7:30	7:30	7:00	6:30	6:00	5:30	5:30
Owensboro, Ky. (C)	5:00	5:30	6:00	6:30	6:45	7:15	7:15	6:45	6:00	5:15	4:45	4:30
Paducah, Ky. (C)	5:00	5:30	6:00	6:30	7:00	7:15	7:15	6:45	6:00	5:15	4:45	4:45
Palestine, Tex. (C)	5:45	6:15	6:30	6:45	7:15	7:30	7:30	7:00	6:30	5:45	5:30	5:15
Pampa, Tex. (C)	6:00	6:30	6:45	7:15	7:45	8:00	8:00	7:30	7:00	6:15	5:45	5:30
Paragould, Ark. (C)	5:15	5:45	6:15	6:30	7:00	7:15	7:15	7:00	6:15	5:30	5:00	4:45
Paris, Tex. (C)	5:30	6:00	6:30	7:00	7:15	7:30	7:30	7:15	6:30	5:45	5:15	5:15
Paterson, N. J. (E)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
Pensacola, Fla. (C)	5:15	5:30	6:00	6:15	6:30	6:45	7:00	6:30	6:00	5:15	4:45	4:45
Peoria Heights, Ill. (C)	5:00	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
Petersburg, Va. (E)	5:15	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	5:00	5:00
Philadelphia, Pa. (E)	5:00	5:30	6:00	6:45	7:15	7:30	7:30	7:00	6:15	5:30	4:45	4:30
Phoenix, Ariz. (M)	5:45	6:15	6:30	7:00	7:15	7:45	7:45	7:15	6:30	6:00	5:30	5:15
Pierre, S. Dak. (C)	5:30	6:15	6:45	7:30	8:00	8:30	8:30	7:45	7:00	6:00	5:15	5:00
Pittsburg, Kansas (C)	5:30	6:00	6:30	7:00	7:15	7:45	7:45	7:15	6:30	5:45	5:15	5:00
Pittsburgh, Pa. (E)	5:15	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:00	5:00
Pittsfield, Mass. (E)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:30	4:15
Plattsburg, N. Y. (E)	4:45	5:15	6:00	6:30	7:15	7:45	7:45	7:00	6:00	5:15	4:30	4:14
Pocatello, Idaho (M)	5:15	6:00	6:30	7:15	7:45	8:15	8:00	7:30	6:45	5:45	5:15	5:00
Ponca City, Okla. (C)	5:30	6:15	6:30	7:00	7:30	7:45	7:45	7:15	6:45	6:00	5:15	5:15
Ponce, P. R. (AST)	6:15	6:30	6:30	6:45	6:45	7:00	7:00	7:00	6:30	6:00	5:45	6:00
Poplar Bluff, Mo. (C)	5:15	5:45	6:15	6:30	7:00	7:15	7:15	7:00	6:15	5:30	5:00	4:45
Portland, Maine (E)	4:30	5:15	5:45	6:30	7:00	7:30	7:15	6:45	6:00	5:00	4:15	4:00
Portland, Ore. (P)	4:45	5:30	6:15	7:00	7:30	8:00	8:00	7:15	6:30	5:30	4:45	4:30
Portsmouth, N. H. (E)	4:30	5:15	5:45	6:30	7:00	7:30	7:15	6:45	6:00	5:00	4:15	4:15
Poynette, Wis. (C)	4:45	5:30	6:00	6:45	7:15	7:45	7:45	7:00	6:15	5:15	4:30	4:15
Prescott, Ariz. (M)	5:45	6:15	6:45	7:00	7:30	7:45	7:45	7:15	6:45	6:00	5:30	5:30
Providence, R. I. (E)	4:45	5:15	5:45	6:30	7:00	7:30	7:15	6:45	6:00	5:00	4:30	4:15
Pueblo, Colo. (M)	5:00	5:30	6:00	6:30	7:00	7:30	7:15	7:00	6:15	5:15	4:45	4:45
Pullman, Wash. (P)	4:30	5:15	6:00	6:30	7:15	7:45	7:45	7:00	6:00	5:00	4:15	4:00
Queens, N. Y. (E)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:45	4:30
Quincy, Ill. (C)	5:00	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	4:45	4:45
Racine, Wis. (C)	4:45	5:15	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:30	4:15
Raleigh, N. C. (E)	5:30	6:00	6:15	6:45	7:15	7:30	7:30	7:00	6:30	5:45	5:15	5:00
Rapid City, S. Dak. (M)	4:45	5:15	6:00	6:30	7:15	7:45	7:30	7:00	6:00	5:15	4:30	4:15
Reading, Pa. (E)	5:00	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	4:45	4:45
Rice Lake, Wis. (C)	4:45	5:30	6:15	6:45	7:30	8:00	8:00	7:15	6:15	5:30	4:45	4:30
Richmond, N. Y. (E)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:45	4:30
Richmond, Va. (E)	5:15	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	5:00	5:00

	Month											
	January	February	March	April	May	June	July	August	September	October	November	December
Roanoke, Va. (E)	5:30	6:00	6:30	7:00	7:15	7:45	7:45	7:15	6:30	5:45	5:15	5:00
Rochester, Minn. (C)	5:00	5:45	6:15	7:00	7:30	8:00	7:45	7:15	6:30	5:30	4:45	4:30
Rochester, N. Y. (E)	5:00	5:45	6:15	6:45	7:30	7:45	7:45	7:15	6:15	5:30	4:45	4:30
Rockford, Ill. (C)	4:45	5:30	6:00	6:30	7:15	7:30	7:30	7:00	6:15	5:15	4:30	4:30
Rock Island, Ill. (C)	5:00	5:30	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	4:45	4:30
Rock Springs, Wyo. (M)	5:15	5:45	6:30	7:00	7:30	8:00	7:45	7:15	6:30	5:45	5:00	4:45
Rome, Ga. (C)	5:00	5:30	5:45	6:15	6:30	7:00	7:00	6:30	5:45	5:15	4:30	4:30
Roseburg, Ore. (P)	5:00	5:45	6:15	7:00	7:30	8:00	7:45	7:15	6:30	5:30	4:45	4:45
Rutland, Vt. (E)	4:45	5:15	6:00	6:30	7:15	7:30	7:30	7:00	6:00	5:15	4:30	4:15
Sacramento, Calif. (P)	5:15	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	5:00	4:45
Safford, Ariz. (M)	5:30	6:00	6:30	6:45	7:15	7:30	7:30	7:00	6:00	5:45	5:15	5:15
Salem, Ore. (P)	5:00	5:45	6:15	7:00	7:30	8:00	8:00	7:15	6:30	5:30	4:45	4:30
Salina, Kans. (C)	5:30	6:00	6:30	7:00	7:30	8:00	8:00	7:30	6:45	6:00	5:15	5:15
Salisbury, Md. (E)	5:00	5:45	6:15	6:45	7:00	7:30	7:30	7:00	6:15	5:30	4:45	4:45
Salisbury, N. C. (E)	5:30	6:00	6:30	7:00	7:15	7:45	7:45	7:15	6:30	5:45	5:15	5:15
Salt Lake City, Utah (M)	5:30	6:00	6:30	7:00	7:30	8:00	8:00	7:30	6:45	5:45	5:15	5:00
San Angelo, Tex. (C)	6:00	6:30	6:45	7:15	7:30	7:45	7:45	7:30	6:45	6:15	5:45	5:45
San Antonio, Tex. (C)	6:00	6:30	6:45	7:00	7:15	7:30	7:30	7:15	6:45	6:00	5:45	5:30
San Diego, Calif. (P)	5:00	5:30	6:00	6:15	6:45	7:00	7:00	6:30	6:00	5:15	4:45	4:45
San Francisco, Calif. (P)	5:15	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	5:00	4:45
San Juan, P. R. (AST)	6:15	6:30	6:30	6:45	6:45	7:00	7:00	6:45	6:30	6:00	5:45	5:45
San Luis Obispo, Calif. (P)	5:15	5:45	6:15	6:30	7:00	7:15	7:15	7:00	6:15	5:30	5:00	4:45
Santa Barbara, Calif. (P)	5:15	5:45	6:00	6:30	7:00	7:15	7:15	6:45	6:15	5:30	5:00	4:45
Santa Fe, N. Mex. (M)	5:15	5:45	6:15	6:30	7:00	7:15	7:15	7:00	6:15	5:30	5:00	4:45
Santa Rosa, Calif. (P)	5:15	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	5:00	4:45
Saranac Lake, N. Y. (E)	4:45	5:30	6:00	6:45	7:15	7:45	7:45	7:00	6:15	5:15	4:30	4:15
Schenectady, N. Y. (E)	4:45	5:30	6:00	6:30	7:15	7:30	7:30	7:00	6:15	5:15	4:30	4:15
Scottsbluff, Nebr. (M)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:30	4:30
Scranton, Pa. (E)	5:00	5:30	6:15	6:45	7:15	7:45	7:30	7:00	6:15	5:30	4:45	4:30
Seattle, Wash. (P)	4:45	5:30	6:15	7:00	7:45	8:15	8:00	7:30	6:30	5:30	4:30	4:15
Selma, Ala. (C)	5:00	5:30	6:00	6:15	6:45	7:00	7:00	6:30	6:00	5:15	4:45	4:45
Sharon, Pa. (E)	5:15	6:00	6:30	7:00	7:30	8:00	8:00	7:15	6:30	5:45	5:00	5:00
Shawnee, Okla. (C)	5:15	5:45	6:00	6:30	6:45	7:00	7:00	6:45	6:00	5:30	5:00	4:45
Sheboygan, Wis. (C)	4:45	5:15	6:00	6:30	7:15	7:30	7:30	7:00	6:00	5:15	4:30	4:15
Shenandoah, Iowa (C)	5:15	6:00	6:00	7:00	7:30	8:00	7:45	7:15	6:30	5:45	5:00	5:00
Sheridan, Wyo. (M)	4:45	5:30	6:15	6:45	7:30	8:00	7:45	7:15	6:15	5:30	4:45	4:30
Sherman, Tex. (C)	5:45	6:15	6:30	7:00	7:15	7:45	7:45	7:15	6:30	6:00	5:30	5:15
Shreveport, La. (C)	5:30	6:00	6:15	6:45	7:00	7:30	7:30	7:00	6:30	5:45	5:15	5:15
Siloam Springs, Ark. (C)	5:30	6:00	6:30	6:45	7:15	7:30	7:30	7:15	6:30	5:45	5:15	5:00
Sioux City, Iowa (C)	5:15	6:00	6:30	7:00	7:45	8:00	8:00	7:30	6:45	5:45	5:00	5:00
Sioux Falls, S. Dak. (C)	5:15	6:00	6:30	7:15	7:45	8:15	8:00	7:30	6:45	5:45	5:00	4:45
Somerville, Mass. (E)	4:30	5:15	5:45	6:30	7:00	7:30	7:15	6:45	6:00	5:00	4:30	4:15
South Bend, Ind. (C)	4:45	5:15	5:45	6:30	7:00	7:15	7:15	6:45	6:00	5:00	4:30	4:15
South Madison, Wis. (C)	4:45	5:30	6:00	6:45	7:15	7:45	7:30	7:00	6:15	5:15	4:30	4:30
Spartanburg, S. C. (E)	5:45	6:15	6:30	7:00	7:30	7:45	7:45	7:15	6:30	6:00	5:30	5:15
Spokane, Wash. (P)	4:30	5:15	6:00	6:45	7:15	7:45	7:45	7:00	6:00	5:00	4:15	4:00
Springfield, Ill. (C)	5:00	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
Springfield, Mass. (E)	4:45	5:15	6:00	6:30	7:00	7:30	7:30	6:45	6:00	5:15	4:30	4:15
Springfield, Mo. (C)	5:15	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:30	5:45	5:00	5:00
Springfield, Vt. (E)	4:45	5:15	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:30	4:15
St. Albans, Vt. (E)	4:30	5:15	6:00	6:30	7:15	7:45	7:30	7:00	6:00	5:15	4:30	4:15
St. Augustine, Fla. (E)	5:45	6:15	6:30	7:00	7:15	7:30	7:30	7:15	6:30	6:00	5:30	5:30
St. Cloud, Minn. (C)	5:00	5:45	6:15	7:00	7:45	8:00	8:00	7:30	6:30	5:30	4:45	4:30
St. Joseph, Mo. (C)	5:15	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:00	5:00
St. Louis, Mo. (C)	5:00	5:45	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:30	4:45	4:45
State College, N. Mex. (M)	5:30	5:45	6:15	6:30	7:00	7:15	7:15	7:00	6:15	5:30	5:00	5:00
State College, Pa. (E)	5:00	5:45	6:15	6:45	7:15	7:45	7:45	7:15	6:15	5:30	5:00	4:45
Stevens Point, Wis. (C)	4:45	5:30	6:00	6:45	7:15	7:45	7:45	7:00	6:15	5:15	4:30	4:15
Stockton, Calif. (P)	5:15	5:45	6:15	6:45	7:00	7:30	7:30	7:00	6:15	5:30	5:00	4:45
Superior, Wis. (C)	4:45	5:30	6:15	7:00	7:30	8:00	8:00	7:15	6:15	5:30	4:30	4:15
Syracuse, N. Y. (E)	5:00	5:30	6:15	6:45	7:15	7:45	7:45	7:15	6:15	5:30	4:45	4:30
Tacoma, Wash. (P)	4:45	5:30	6:15	7:00	7:45	8:15	8:00	7:30	6:30	5:30	4:30	4:15
Tallahassee, Fla. (E)	6:00	6:30	6:45	7:00	7:30	7:45	7:45	7:15	6:45	6:00	5:45	5:45
Tallmadge, Ohio (E)	5:15	6:00	6:30	7:00	7:30	8:00	8:00	7:30	6:45	5:45	5:15	5:00
Tampa, Fla. (E)	6:00	6:15	6:45	7:00	7:15	7:30	7:30	7:15	6:30	6:00	5:30	5:30
Temple, Tex. (C)	5:45	6:15	6:45	7:00	7:15	7:30	7:30	7:15	6:30	6:00	5:30	5:30
Terre Haute, Ind. (C)	4:45	5:30	6:00	6:30	7:00	7:15	7:15	6:45	6:00	5:15	4:30	4:30
Texarkana, Tex. (C)	5:30	6:00	6:30	6:45	7:15	7:30	7:30	7:00	6:30	5:45	5:15	5:15
Thomasville, Ga. (E)	6:00	6:30	6:45	7:00	7:30	7:45	7:45	7:15	6:45	6:00	5:45	5:30
Toledo, Ohio (E)	5:30	6:00	6:45	7:15	7:45	8:15	8:15	7:30	6:45	6:00	5:15	5:00
Topeka, Kans. (C)	5:30	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:15	5:00
Trenton, N. J. (E)	5:00	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
Troy, Ala. (C)	5:00	5:30	5:45	6:15	6:30	6:45	6:45	6:30	5:45	5:15	4:45	4:45
Troy, N. Y. (E)	4:45	5:30	6:00	6:30	7:15	7:30	7:30	7:00	6:00	5:15	4:30	4:15

	Month											
	January	February	March	April	May	June	July	August	September	October	November	December
Tucson, Ariz. (M)	5:45	6:15	6:30	7:00	7:15	7:30	7:30	7:15	6:30	6:00	5:30	5:15
Tulsa, Okla. (C)	5:30	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:15	5:15
Tupelo, Miss. (C)	5:15	5:45	6:00	6:30	6:45	7:15	7:15	6:45	6:00	5:15	4:45	4:45
Tupper Lake, N. Y. (E)	4:45	5:30	6:00	6:45	7:15	7:45	7:45	7:00	6:15	5:15	4:30	4:15
Tuscaloosa, Ala. (C)	5:15	5:45	6:00	6:30	6:45	7:00	7:00	6:45	6:00	5:30	5:00	4:45
Tuscola, Ill. (C)	4:45	5:30	6:00	6:30	7:00	7:15	7:15	6:45	6:00	5:15	4:45	4:30
Twin Falls, Idaho (M)	5:30	6:15	6:45	7:15	7:45	8:15	8:15	7:45	6:45	6:00	5:15	5:00
Tyler, Texas (C)	5:45	6:00	6:30	6:45	7:15	7:30	7:30	7:00	6:30	5:45	5:15	5:15
Union City, Tenn. (C)	5:00	5:30	6:00	6:30	7:00	7:15	7:15	6:45	6:00	5:15	4:45	4:45
Uniontown, Pa. (E)	5:15	6:00	6:30	7:00	7:30	7:45	7:45	7:15	6:30	5:45	5:00	5:00
Urbana, Ill. (C)	4:45	5:30	6:00	6:30	7:00	7:30	7:15	6:45	6:00	5:15	4:45	4:30
Utica, N. Y. (E)	4:45	5:30	6:00	6:45	7:15	7:45	7:45	7:00	6:15	5:15	4:45	4:30
Valley City, N. Dak. (C)	5:15	6:00	6:30	7:15	8:00	8:30	8:30	7:45	6:45	5:45	5:00	4:45
Vancouver, Wash. (P)	4:45	5:30	6:15	7:00	7:30	8:00	8:00	7:15	6:30	5:30	4:45	4:30
Vermillion, S. Dak. (C)	5:15	6:00	6:30	7:15	7:45	8:15	8:00	7:30	6:45	5:45	5:00	5:00
Vernon, Tex. (C)	5:45	6:15	6:45	7:15	7:30	7:45	7:45	7:30	6:45	6:00	5:30	5:30
Vicksburg, Miss. (C)	5:15	5:45	6:15	6:30	7:00	7:15	7:15	6:45	6:15	5:30	5:00	5:00
Virginia, Minn. (C)	4:45	5:30	6:15	7:00	7:45	8:15	8:00	7:30	6:30	5:30	4:30	4:45
Visalia, Calif. (P)	5:00	5:45	6:00	6:30	7:00	7:15	7:15	6:45	6:00	5:30	4:45	4:45
Waco, Tex. (C)	5:45	6:15	6:30	7:00	7:15	7:30	7:30	7:15	6:30	6:00	5:30	5:30
Walla Walla, Wash. (P)	4:30	5:15	6:00	6:45	7:15	7:45	7:45	7:00	6:00	5:15	4:45	4:15
Wallace, Idaho (P)	4:15	5:00	5:45	6:30	7:15	7:45	7:45	7:00	6:00	5:00	4:15	4:00
Washington, D. C. (E)	5:15	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	5:00	4:45
Waterbury, Vt. (E)	4:30	5:15	6:00	6:30	7:15	7:30	7:30	7:00	6:00	5:15	4:30	4:15
Waterloo, Iowa (C)	5:0	5:45	6:15	6:45	7:30	7:45	7:45	7:15	6:15	5:30	4:45	4:30
Watertown, N. Y. (E)	4:45	5:30	6:15	6:45	7:15	7:45	7:45	7:15	6:15	5:15	4:45	4:30
Watsonville, Calif. (P)	5:00	5:45	6:00	6:30	7:00	7:15	7:15	7:00	6:15	5:30	4:45	4:45
Waukegan, Ill. (C)	4:45	5:15	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:30	4:15
Wausau, Wis. (C)	4:45	5:30	6:00	6:45	7:15	7:45	7:45	7:00	6:15	5:15	4:30	4:15
Waycross, Ga. (E)	5:45	6:15	6:45	7:00	7:15	7:30	7:30	7:15	6:30	6:00	5:30	5:30
Wenatchee, Wash. (P)	4:30	5:30	6:00	6:45	7:30	8:00	8:00	7:15	6:15	5:15	4:30	4:15
West Lafayette, Ind. (C)	4:45	5:15	6:00	6:30	7:00	7:15	7:15	6:45	6:00	5:15	4:30	4:30
West Palm Beach, Fla. (E)	5:45	6:15	6:30	6:45	7:00	7:15	7:15	7:00	6:30	6:00	5:30	5:30
Wheeling, W. Va. (E)	5:15	6:00	6:30	7:00	7:30	8:00	7:45	7:15	6:30	5:45	5:15	5:00
Wichita, Kans. (C)	5:30	6:00	6:30	7:00	7:30	7:45	7:45	7:30	6:45	6:00	5:15	5:15
Wichita Falls, Tex. (C)	5:45	6:15	6:45	7:00	7:30	7:45	7:45	7:15	6:45	6:00	5:30	5:30
Wilkes-Barre, Pa. (E)	5:00	5:30	6:15	6:45	7:15	7:45	7:30	7:00	6:15	5:30	4:45	4:30
Williamson, W. Va. (E)	5:30	6:15	6:30	7:00	7:30	7:45	7:45	7:30	6:45	6:00	5:15	5:15
Williamsport, Pa. (E)	5:00	5:45	6:15	6:45	7:15	7:45	7:45	7:15	6:15	5:30	4:45	4:45
Wilmington, Del. (E)	5:00	5:30	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	4:45	4:45
Wilmington, N. C. (E)	5:30	6:00	6:15	6:45	7:00	7:30	7:30	7:00	6:15	5:45	5:15	5:00
Wilson, N. C. (E)	5:15	6:00	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:45	5:00	5:00
Winona, Minn. (C)	5:00	5:30	6:15	6:45	7:30	7:45	7:45	7:15	6:15	5:30	4:45	4:30
Winston-Salem, N. C. (E)	5:30	6:00	6:30	7:00	7:15	7:45	7:45	7:15	6:30	5:45	5:15	5:15
Wolf Point, Mont. (M)	4:30	5:30	6:00	6:45	7:30	8:00	8:00	7:15	6:15	5:15	4:30	4:15
Worcester, Mass. (E)	4:45	5:15	6:00	6:30	7:00	7:30	7:30	6:45	6:00	5:00	4:30	4:15
Yakima, Wash (P)	4:45	5:30	6:00	6:45	7:30	8:00	8:00	7:15	6:15	5:15	4:30	4:15
Yankton, S. Dak. (C)	5:15	6:00	6:30	7:15	7:45	8:15	8:00	7:30	6:45	5:45	5:15	5:00
Yonkers, N. Y. (E)	4:45	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:45	4:30
York, Nebr. (C)	5:30	6:00	6:30	7:15	7:45	8:00	8:00	7:30	6:45	5:45	5:15	5:00
York, Pa. (E)	5:00	5:45	6:15	6:45	7:15	7:30	7:30	7:00	6:15	5:30	4:45	4:45
Youngstown, Ohio (E)	5:15	6:00	6:30	7:00	7:30	8:00	8:00	7:15	6:30	5:45	5:00	5:00
Zarephath, N. J. (E)	5:00	5:30	6:00	6:30	7:00	7:30	7:30	7:00	6:15	5:15	4:45	4:30
Zion, Ill. (C)	4:45	5:15	6:00	6:30	7:00	7:30	7:30	7:00	6:00	5:15	4:30	4:15

[SEAL]

T. J. SLOWIE,
Secretary.

[F. R. Doc. 39-2328; Filed, July 5, 1939; 11:38 a. m.]

TITLE 49—TRANSPORTATION AND RAILROADS

INTERSTATE COMMERCE COMMISSION

[No. M-17310]

WAIVE TARIFF RULES

AUTOMATIC POSTPONEMENT

[*Corrected Order* [1]]

JUNE 29, 1939.

Permission under Section 217 or 218 of the Motor Carrier Act, 1935, to depart from the requirements of the Commission's tariff regulations.

Present: John L. Rogers, Commissioner, to whom the above entitled matter has been assigned for action thereon.

Ordered, That all carriers by motor vehicle, subject to the Motor Carrier Act, 1935, and their duly appointed agents are hereby authorized to publish the following provisions in supplements announcing resuspension of the rates and other tariff provisions:

"If this supplement is not cancelled on or before (here insert date to which resuspended) the effective date of the above-described suspended schedules remaining under suspension on that date is hereby postponed to the date upon which this supplement is cancelled. The rates, charges, classifications, rules, regulations, practices, and other provisions, continued in force by the above-mentioned order of suspension, will apply during the period of this postponement unless changed under authority of special permission or order of the Interstate Commerce Commission."

Provided, That any supplement filed under this authority shall not include the announcement of suspension in more than one I. and S. Docket,

Provided further, That the authority granted hereby may be used only to postpone the effective date of suspended matter beyond the date of expiration of the second period of suspension,

And provided further, That the continuance of this authorization is made subject to the condition, that subject to the decision of the Commission in I. and S. Docket proceedings involved, carriers or their agents shall, with reasonable promptness, file schedules making final disposition of the matter under suspension or postponement.

It is further ordered, That supplements filed under this authority must bear the following notation:

"Departure from the Commission's tariff rules is authorized under special permission of the Interstate Commerce Commission No. M-17310 of June 29, 1939."

Dated at Washington, D. C., this 29th day of June 1939.

[1] 4 F.R. 2772 DI.

By the Commission, Commissioner Rogers.

[SEAL] W. P. BARTEL, *Secretary.*

[F. R. Doc. 39-2416; Filed, July 7, 1939; 12:16 p. m.]

Notices

FEDERAL TRADE COMMISSION.

United States of America—Before Federal Trade Commission

At a regular session of the Federal Trade Commission, held at its office in the City of Washington, D. C., on the 1st day of July, A. D. 1939.

Commissioners: Robert E. Freer, Chairman; Garland S. Ferguson, Charles H. March, Ewin L. Davis, William A. Ayres.

[Docket No. 3720]

IN THE MATTER OF BENJAMIN GREEN AND HARRY L. MINCH, TRADING AS B. GREEN & COMPANY; ISADOR RUDO AND BARNETTE H. RUDO, TRADING AS THE ATLANTIC GROCERY COMPANY; MORRIS KOLKER, HARRY MARK, AND SAMUEL GUTTMAN, TRADING AS THE MARYLAND GROCERY COMPANY; MICHAEL JOFFEE AND REUBIN JOFFEE, TRADING AS JOFFEE BROTHERS

ORDER APPOINTING EXAMINER AND FIXING TIME AND PLACE FOR TAKING TESTIMONY

This matter being at issue and ready for the taking of testimony and pursuant to authority vested in the Federal Trade Commission, under an Act of Congress (38 Stat. 717; 15 U.S.C.A., Section 41),

It is ordered, That Lewis C. Russell, an examiner of this Commission, be and he hereby is designated and appointed to take testimony and receive evidence in this proceeding and to perform all other duties authorized by law;

It is further ordered, That the taking of testimony in this proceeding begin on Thursday, July 13, 1939, at nine o'clock in the forenoon of that day (eastern standard time) in Room 352, Post Office Building, Baltimore, Maryland.

Upon completion of testimony for the Federal Trade Commission, the examiner is directed to proceed immediately to take testimony and evidence on behalf of the respondent. The examiner will then close the case and make his report.

By the Commission.

[SEAL] OTIS B. JOHNSON, *Secretary.*

[F. R. Doc. 39-2402; Filed, July 7, 1939; 9:43 a. m.]

United States of America—Before Federal Trade Commission

At a regular session of the Federal Trade Commission, held at its office in the City of Washington, D. C., on the 1st day of July, A. D. 1939.

Commissioners: Robert E. Freer, Chairman; Garland S. Ferguson, Charles H. March, Ewin L. Davis, William A. Ayres.

[Docket No. 3763]

IN THE MATTER OF CHARLES E. HERCHENROEDER, INDIVIDUALLY AND TRADING AS PREMIUM SALES SERVICE

ORDER APPOINTING EXAMINER AND FIXING TIME AND PLACE FOR TAKING TESTIMONY

This matter being at issue and ready for the taking of testimony, and pursuant to authority vested in the Federal Trade Commission, under an Act of Congress (38 Stat. 717, 15 U.S.C.A., Section 41),

It is ordered, That Miles J. Furnas, an examiner of this Commission, be and he hereby is designated and appointed to take testimony and receive evidence in this proceeding and to perform all other duties authorized by law;

It is further ordered, That the taking of testimony in this proceeding begin on Thursday, July 20, 1939, at one o'clock in the afternoon of that day (central standard time), in Room 1123, New Post Office Building, 433 West Van Buren Street, Chicago, Illinois.

Upon completion of testimony for the Federal Trade Commission, the examiner is directed to proceed immediately to take testimony and evidence on behalf of the respondent. The examiner will then close the case and make his report.

By the Commission.

[SEAL] OTIS B. JOHNSON, *Secretary.*

[F. R. Doc. 39-2403; Filed, July 7, 1939; 9:43 a. m.]

United States of America—Before Federal Trade Commission

At a regular session of the Federal Trade Commission, held at its office in the City of Washington, D. C., on the 1st day of July, A. D. 1939.

Commissioners: Robert E. Freer, Chairman; Garland S. Ferguson, Charles H. March, Ewin L. Davis, William A. Ayres.

[Docket No. 3767]

IN THE MATTER OF JEAN LAWRENCE, INDIVIDUALLY, AND TRADING AS WELLS SALES COMPANY

ORDER APPOINTING EXAMINER AND FIXING TIME AND PLACE FOR TAKING TESTIMONY

This matter being at issue and ready for the taking of testimony, and pursuant to authority vested in the Federal Trade Commission, under an Act of Congress (38 Stat. 717; 15 U.S.C.A., Section 41),

It is ordered, That Miles J. Furnas, an examiner of this Commission, be and he hereby is designated and appointed to take testimony and receive evidence in

this proceeding and to perform all other duties authorized by law;

It is further ordered, That the taking of testimony in this proceeding begin on Wednesday, July 19, 1939, at one o'clock in the afternoon of that day (central standard time) in Room 1123, New Post Office Building, 433 West Van Buren Street, Chicago, Illinois.

Upon completion of testimony for the Federal Trade Commission, the examiner is directed to proceed immediately to take testimony and evidence on behalf of the respondent. The examiner will then close the case and make his report.

By the Commission.

[SEAL] OTIS B. JOHNSON, *Secretary.*

[F. R. Doc. 39-2404; Filed, July 7, 1939; 9:43 a. m.]

United States of America—Before Federal Trade Commission

At a regular session of the Federal Trade Commission, held at its office in the City of Washington, D. C., on the 1st day of July, A. D. 1939.

Commissioners: Robert E. Freer, Chairman; Garland S. Ferguson, Charles H. March, Ewin L. Davis, William A. Ayres.

[Docket No. 3780]

IN THE MATTER OF DAVID KRITZIK, INDIVIDUALLY, AND TRADING AS GENERAL MERCHANDISE COMPANY

ORDER APPOINTING EXAMINER AND FIXING TIME AND PLACE FOR TAKING TESTIMONY

This matter being at issue and ready for the taking of testimony, and pursuant to authority vested in the Federal Trade Commission, under an Act of Congress (38 Stat. 717; 15 U.S.C.A., Section 41),

It is ordered, That Miles J. Furnas, an examiner of this Commission, be and he hereby is designated and appointed to take testimony and receive evidence in this proceeding and to perform all other duties authorized by law;

It is further ordered, That the taking of testimony in this proceeding begin on Monday, July 17, 1939, at ten o'clock in the forenoon of that day (central standard time) in Room 322, Federal Building, Milwaukee, Wisconsin.

Upon completion of testimony for the Federal Trade Commission, the examiner is directed to proceed immediately to take testimony and evidence on behalf of the respondent. The examiner will then close the case and make his report.

By the Commission.

[SEAL] OTIS B. JOHNSON, *Secretary.*

[F. R. Doc. 39-2405; Filed, July 7, 1939; 9:43 a. m.]

United States of America—Before Federal Trade Commission

At a regular session of the Federal Trade Commission, held at its office in the City of Washington, D. C., on the 1st day of July, A. D. 1939.

Commissioners: Robert E. Freer, Chairman; Garland S. Ferguson, Charles H. March, Ewin L. Davis, William A. Ayres.

[Docket No. 3806]

IN THE MATTER OF ISAAC S. FRIEDMAN, AN INDIVIDUAL, TRADING AS WRIGHT PRODUCTS COMPANY

ORDER APPOINTING EXAMINER AND FIXING TIME AND PLACE FOR TAKING TESTIMONY

This matter being at issue and ready for the taking of testimony, and pursuant to authority vested in the Federal Trade Commission, under an Act of Congress (38 Stat. 717; 15 U.S.C.A., Section 41),

It is ordered, That Miles J. Furnas, an examiner of this Commission, be and he hereby is designated and appointed to take testimony and receive evidence in this proceeding and to perform all other duties authorized by law;

It is further ordered, That the taking of testimony in this proceeding begin on Wednesday, July 19, 1939, at nine o'clock in the forenoon of that day (central standard time) in Room 1123, new Post Office Building, 433 West Van Buren Street, Chicago, Illinois.

Upon completion of testimony for the Federal Trade Commission, the examiner is directed to proceed immediately to take testimony and evidence on behalf of the respondent. The examiner will then close the case and make his report.

By the Commission.

[SEAL] OTIS B. JOHNSON, *Secretary.*

[F. R. Doc. 39-2406; Filed, July 7, 1939; 9:44 a. m.]

United States of America—Before Federal Trade Commission

At a regular session of the Federal Trade Commission, held at its office in the City of Washington, D. C., on the 1st day of July, A. D. 1939.

Commissioners: Robert E. Freer, Chairman; Garland S. Ferguson, Charles H. March, Ewin L. Davis, William A. Ayres.

[Docket No. 3807]

IN THE MATTER OF ILLINOIS NUT PRODUCTS COMPANY, A CORPORATION

ORDER APPOINTING EXAMINER AND FIXING TIME AND PLACE FOR TAKING TESTIMONY

This matter being at issue and ready for the taking of testimony, and pursuant to authority vested in the Federal Trade Commission, under an Act of Congress (38 Stat. 717; 15 U.S.C.A., Section 41),

It is ordered, That Miles J. Furnas, an examiner of this Commission, be and he hereby is designated and appointed to take testimony and receive evidence in this proceeding and to perform all other duties authorized by law;

It is further ordered, That the taking of testimony in this proceeding begin on Monday, July 24, 1939, at nine o'clock in the forenoon of that day (central standard time) in Room 1123, New Post Office Building, 433 West Van Buren Street, Chicago, Illinois.

Upon completion of testimony for the Federal Trade Commission, the examiner is directed to proceed immediately to take testimony and evidence on behalf of the respondent. The examiner will then close the case and make his report.

By the Commission.

[SEAL] OTIS B. JOHNSON, *Secretary.*

[F. R. Doc. 39-2407; Filed, July 7, 1939; 9:44 a. m.]

SECURITIES AND EXCHANGE COMMISSION.

United States of America—Before the Securities and Exchange Commission

At a regular session of the Securities and Exchange Commission held at its office in the City of Washington, D. C., on the 5th day of July, A. D. 1939.

[File No. 43-227]

IN THE MATTER OF GENERAL WATER GAS & ELECTRIC COMPANY, INTERNATIONAL UTILITIES CORPORATION

NOTICE OF AND ORDER FOR HEARING

A declaration pursuant to section 7 of the Public Utility Holding Company Act of 1935, having been duly filed with this Commission by General Water Gas & Electric Company; an application pursuant to section 10 of the Public Utility Holding Company Act of 1935, having been duly filed with this Commission by General Water Gas & Electric Company; and an application pursuant to section 10 of the Public Utility Holding Company Act of 1935, having been duly filed with this Commission by International Utilities Corporation;

It is ordered, That a hearing on such matters be held on July 24, 1939, at 10:00 o'clock in the forenoon of that day, at the Securities and Exchange Building, 1778 Pennsylvania Avenue, N. W., Washington, D. C. On such day the hearing-room clerk in room 1102 will advise as to the room where such hearing will be held. At such hearing, if in respect of any declaration, cause shall be shown why such declaration shall become effective.

It is further ordered, That Edward C. Johnson or any other officer or officers of the Commission designated by it for that purpose shall preside at the hearings in such matter. The officer so designated to preside at any such hearing is hereby authorized to exercise all powers granted to the Commission under section 18 (c) of said Act and to a trial examiner under the Commission's Rules of Practice to continue or postpone said hearing from time to time.

Notice of such hearing is hereby given to such declarant or applicant and to

any other person whose participation in such proceeding may be in the public interest or for the protection of investors or consumers. It is requested that any person desiring to be heard or to be admitted as a party to such proceeding shall file a notice to that effect with the Commission on or before July 19, 1939.

The matter concerned herewith is in regard to—

(a) A declaration pursuant to Section 7 of the Public Utility Holding Company Act of 1935 by General Water Gas & Electric Company, a subsidiary of a registered holding company, with regard to the issue and sale at par of two promissory notes, (1) in the face amount of $1,200,000, with interest at the rate of 3%, to be sold to Chase National Bank, New York City, and (2) in the face amount of $1,000,000, with interest at the rate of 6%, to be sold to International Utilities Corporation, the parent of General Water Gas & Electric Company, such note to be subordinated to the note in the face amount of $1,200,000, which is to be sold to Chase National Bank; and

(b) An application by General Water Gas & Electric Company pursuant to Section 10 of the Public Utility Holding Company Act of 1935, with regard to the acquisition of 24,142 shares of the common stock, of the par value of $100 each, of California Water Service Company from Federal Water Service Corporation, a registered holding company, for a total price of $3,200,000; and

(c) An application by International Utilities Corporation pursuant to Section 10 of the Public Utility Holding Company Act of 1935, with regard to the acquisition by it of a promissory note in the face amount of $1,000,000 issued by General Water Gas & Electric Company to bear interest at the rate of 6% and to be subordinated to a note in the face amount of $1,300,000 to be issued and sold by General Water Gas & Electric Company to Chase National Bank.

By the Commission.

[SEAL] FRANCIS P. BRASSOR, *Secretary.*

[F. R. Doc. 39-2412; Filed, July 7, 1939; 10:58 a. m.]

United States of America—Before the Securities and Exchange Commission

At a regular session of the Securities and Exchange Commission held at its office in the City of Washington, D. C., on the 5th day of July, A. D. 1939.

[File No. 58-16]

IN THE MATTER OF NORTHERN INDIANA PUBLIC SERVICE COMPANY

ORDER APPROVING SALE OF STOCK

Northern Indiana Public Service Company, a subsidiary of the Trustees of Midland Utilities Company, a registered holding company, having duly filed with this Commission an application pursuant to Rule U-12F-1 of the General Rules and Regulations under the Public Utility Holding Company Act of 1935 for approval of the sale of the 215,280 shares of the common capital stock of Chicago District Electric Generating Corporation, which it owns, to Commonwealth Edison Company of Chicago, Illinois, for the sum of $2,513,734.73, plus interest at the rate of 5% per annum from January 1, 1939 to the date of payment of the purchase price, plus an amount equal to 18.44% of any excess of the reserve for taxes on the books of Chicago District Electric Generating Corporation as at December 31, 1938 over the actual aggregate liability for taxes for the year 1938, less the amount of any reasonable expenses incurred by Chicago District Electric Generating Corporation in the determination of such liability; the Trustees of Midland Utilities Company having joined in and adopted said application of Northern Indiana Public Service Company;

A public hearing on said application having been held[1] after appropriate notice; the Applicant having waived a Trial Examiner's report, submission to it of proposed findings of fact by the Commission or requested findings of fact by counsel to the Commission, and the right to file briefs and make oral argument before the Commission prior to the making of the Commission's findings and the entry of its order herein; and the Commission having as of the date hereof made and filed its findings herein;

It is ordered, That said sale by Northern Indiana Public Service Company of said 215,280 shares of common capital stock of Chicago District Electric Generating Corporation, which it owns, to Commonwealth Edison Company be, and the same is hereby approved, subject, however, to the following conditions:

(1) That said sale shall be effected in accordance with the terms and conditions of, and for the purposes represented by, said application;

(2) That concurrently with said sale of said stock the proposed Electric Service Agreement between Applicant and Chicago District Electric Generating Corporation, marked Applicant's Exhibit #2 in these proceedings, shall be executed and delivered;

(3) That if the express approval and authorization of the sale by the Public Service Commission of the State of Indiana shall be revoked or otherwise terminated, this approval of said sale shall terminate immediately without further order of this Commission; and

(4) That within ten days after the consummation of said sale, Applicant shall file with this Commission a Certificate of Notification showing that said sale has been effected in accordance with the terms and conditions of, and for the purposes represented by, said application, and that said Electric Service Agreement was executed and delivered concurrently with said sale.

By the Commission.

[SEAL] FRANCIS P. BRASSOR, *Secretary.*

[F. R. Doc. 39-2413; Filed, July 7, 1939; 10:57 a. m.]

[1] 4 F.R. 2126 DI.

United States of America—Before the Securities and Exchange Commission

At a regular session of the Securities and Exchange Commission, held at its office in the City of Washington, D. C., on the 6th day of July, A. D. 1939.

[File No. 43-223]

IN THE MATTER OF PEOPLES NATURAL GAS COMPANY

ORDER FOR POSTPONEMENT

It appearing to the Commission that a hearing in the matter of the declaration of Peoples Natural Gas Company, filed pursuant to section 7 of the Public Utility Holding Company Act of 1935, has been set[1] for the 17th day of July, 1939 at 10:00 o'clock in the forenoon, in room 1102 of the offices of the Securities and Exchange Commission in Washington, D. C., and

It further appearing to the Commission that said hearing should be postponed for the reason that it will thus be possible to hold it on the day preceding another hearing to be held with respect to the same holding company system

It is therefore ordered, That the hearing in the above mentioned matter be and the same is hereby postponed until the 24th day of July, 1939, at 10:00 o'clock in the A. M. at the offices of the Securities and Exchange Commission, Washington, D. C., before Willis E. Monty, Trial Examiner. On such day the hearing room clerk in room 1102 will advise as to the room where the hearing will be held. All interested parties or persons will govern themselves accordingly and any and all witnesses heretofore subpoenaed in this matter, unless excused, shall appear and be present at said last mentioned time and place without further subpoena.

By the Commission.

[SEAL] FRANCIS P. BRASSOR, *Secretary.*

[F. R. Doc. 39-2410; Filed, July 7, 1939; 10:58 a. m.]

[1] 4 F.R. 2725 DI.

United States of America—Before the Securities and Exchange Commission

At a regular session of the Securities and Exchange Commission held at its office in the City of Washington, D. C. on the 6th day of July, A. D. 1939.

[File No. 43-224]

IN THE MATTER OF ARGUS NATURAL GAS COMPANY, INC.

ORDER FOR POSTPONEMENT

It appearing to the Commission that a hearing in the matter of the declaration of Argus Natural Gas Company, Inc., filed pursuant to section 7 of the Public Utility Holding Company Act of 1935, has been set[1] for the 17th day of July, 1939 at 10:00 o'clock in the forenoon, in room 1102 of the offices of the Securities and Exchange Commission in Washington, D. C., and

It further appearing to the Commission that said hearing should be postponed for the reason that it will thus be possible to hold it on the day preceding another hearing to be held with respect to the same holding company system

It is therefore ordered, That the hearing in the above mentioned matter be and the same is hereby postponed until the 24th day of July, 1939, at 10:00 o'clock in the A. M. at the offices of the Securities and Exchange Commission, Washington, D. C., before Willis E. Monty, Trial Examiner. On such day the hearing room clerk in room 1102 will advise as to the room where the hearing will be held. All interested parties or persons will govern themselves accordingly and any and all witnesses heretofore subpoenaed in this matter, unless excused, shall appear and be present at said last mentioned time and place without further subpoena.

By the Commission.

[SEAL] FRANCIS P. BRASSOR, *Secretary.*

[F. R. Doc. 39-2411; Filed, July 7, 1939; 10:58 a. m.]

[1] 4 F.R. 2726 DI.

United States of America—Before the Securities and Exchange Commission

At a regular session of the Securities and Exchange Commission held at its office in the City of Washington, D. C., on the 6th day of July, A. D. 1939.

[File No. 43-229]

IN THE MATTER OF NORTHERN NATURAL GAS COMPANY

NOTICE OF AND ORDER FOR HEARING

A declaration pursuant to section 7 of the Public Utility Holding Company Act of 1935, having been duly filed with this Commission by the above-named party;

It is ordered, That a hearing on such matter be held on July 25, 1939, at ten o'clock in the forenoon of that day, at the Securities and Exchange Building, 1778 Pennsylvania Avenue NW., Washington, D. C. On such day the hearing-room clerk in room 1102 will advise as to the room where such hearing will be held. At such hearing, if in respect of any declaration, cause shall be shown why such declaration shall become effective.

It is further ordered, That Willis E. Monty or any other officer or officers of the Commission designated by it for that purpose shall preside at the hearings in such matter. The officer so designated to preside at any such hearing is hereby authorized to exercise all powers granted to the Commission under section 18 (c) of said Act and to a trial examiner under the Commission's Rules of Practice to continue or postpone said hearing from time to time.

Notice of such hearing is hereby given to such declarant or applicant and to any other person whose participation in such proceeding may be in the public interest or for the protection of investors or consumers. It is requested that any person desiring to be heard or to be admitted as a party to such proceeding shall file a notice to that effect with the Commission on or before July 20, 1939.

The matter concerned herewith is in regard to the proposed issue and sale by declarant, a registered holding company, at private sale, of its First Mortgage and First Lien Bonds, Series A, 3¼% due July 1, 1954, in the amount of $16,000,000; and the issue and sale of its unsecured promissory notes bearing interest at 2⅛%, in the aggregate amount of $6,000,000, maturing serially in principal amounts of $500,000 on January 1 and July 1, commencing July 1, 1940, the last note maturing on January 1, 1946, to The Chase National Bank of the City of New York. Declarant states that the proceeds of the bonds are to be used for the retirement of all of the declarant's presently outstanding funded debt, and that the proceeds of the notes are to be used for the construction of a transmission line from near Sioux City, Iowa, to a point near Minneapolis, Minnesota, compressor station property, lateral pipe lines and distribution system incidental to the said extension and additions and improvements to declarant's present property, including distribution property of subsidiaries, gasoline manufacturing plant, telephone system, compressor station property, etc.

By the Commission.

[SEAL] FRANCIS P. BRASSOR, *Secretary.*

[F. R. Doc. 39-2409; Filed, July 7, 1939; 10:57 a. m.]